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A
CYCLOPEDIA OF EDUCATION

EDITED BY

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COLUMBIA UNIVERSITY

WITH THE ASSISTANCE OF DEPARTMENTAL EDITORS
AND
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A CYCLOPEDIA OF EDUCATION

POLYTECHNICS, LONDON. — A name given to a number of institutions in London providing scientific and industrial education and social and recreational opportunities for those engaged in or preparing for the lower branches of industrial and commercial pursuits. The name is perhaps accidental and was adopted in imitation of the institution established by Quintin Hogg (*q.v.*) in Regent St., when in 1881 he took over the polytechnic, a place for popular and semiscientific entertainment, for his Working Lads' Institute. The original plan of the Polytechnic was to provide opportunities for manual and mechanical training for artisans and developed largely under the Science and Art Department. To this movement was soon added the plan, first put forward by Sir W. Besant (*q.v.*) in *All Sorts and Conditions of Men* (1882), for providing centers for social intercourse and recreation for men and women of the lower middle classes. Sir Walter Besant's scheme took shape at the People's Palace, later the East London Technical College, and now the East London College, a school of the University of London (*q.v.*). The growth and success of the polytechnic institutes was fortunately assured by the City Parochial Charities act (1883), an act which released the accumulated charitable funds of most of the London parishes to be devoted to the provision of open spaces, free libraries, polytechnics, the Working Men's College, and other purposes. A central governing board was established under this act to supervise the polytechnics. Private contributions and donations of several city companies, *e.g.* of the Drapers' Co. to the People's Palace, of the Goldsmiths' Co. to the New Cross Polytechnic, the Clothmakers' Co. to the Northern Polytechnic at Islington, assured the establishment of a number of institutes. Further funds were added under the Local Taxation (Customs and Excise) act of 1890, which placed money at the disposal of the London County Council for technical education. In 1894 the London Polytechnic Council was established in place of the Central Governing Board to have general supervision over the educational and administrative work of the polytechnics. In 1904 this Council was dissolved, and the polytechnics came under the control of the London County Council.

After the act of 1883 schemes were drawn up to govern the work of the polytechnics. Their chief educational purpose was to give instruction in arts and science as applied to handicrafts, trades, and business, and to supplement theoretically the practical work of the workshop; to provide public lectures, libraries, and museums; and to afford opportunities for social and physical recreation. Pupils between sixteen and twenty-five were to be admitted, and small fees could be charged. The institutes limited the entrance at first to those students only who were sufficiently prepared to profit by the courses. On the social side many of the polytechnics early provided gymnasiums, playing fields, excursions, clubrooms, and numerous societies sprang up. Educationally there was also a wide expansion, and at present the instruction ranges from continuation work along technical lines for boys and girls from the elementary schools up to undergraduate and postgraduate university work. The following types of schools are provided: (1) day schools for boys and girls, either secondary schools of a modern type, or technical continuation schools giving two or three years' work; (2) domestic economy for girls in small classes, lasting from six to twelve months; (3) trade classes; (4) general courses in science, language, etc., for pupils engaged during the day in wage-earning occupations; (5) day technical schools, schools of arts and crafts, commerce, engineering, architecture, etc.; (6) university work, many teachers in these departments ranking as teachers in the University of London and the students being admitted to the examinations for degrees. Many of the polytechnics are intimately associated with several industries in and around London and give instruction to apprentices and foremen engaged in them. (See APPRENTICESHIP AND EDUCATION.) Various other activities in the field of education are arranged by different polytechnics according to local demands. The polytechnics now receive grants from the Board of Education, under the City Parochial Charities act, and from the London County Council towards salaries, buildings, etc., and from some London companies and guilds. The polytechnics are enabled to reach almost 50,000 students each year. There are now eleven polytechnics in London, as follows: Battersea Polytechnic; Birkbeck College; Borough Road Polytechnic; City of London College; East London College; Northampton Institute; Northern Polytechnic; Regent St. Polytechnic; Southwestern Polytechnic; Woolwich Polytechnic; Sir John Cass's Institute.

In the United States the term is occasionally used for technical or semitechnical schools of a secondary grade that are quasi-public in character. For these, see INDUSTRIAL EDUCATION.

See ADULT EDUCATION; BESANT, WALTER; HOGG, QUINTIN; HOLBROOK, JOSIAH; LONDON, EDUCATION IN; LONDON, UNIVERSITY OF; TECHNICAL EDUCATION.

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POMNEY, FRANCIS. — See INDICULUS UNIVERSALIS.

POMONA COLLEGE, CLAREMONT, CAL. — Founded by the Congregationalists of Southern California and opened in the fall of 1888. The growth of the college in view of its origin and almost complete dependence for many years upon the benefactions of men of moderate means in a pioneer section has been notable. The productive funds now total $540,000, the buildings aggregate a value of $221,300, the equipment $67,730, and the total assets approximately $950,000. The buildings are nine in number. The campus, athletic field, and Blanchard Park, composing grounds of 100 acres extent, are situated at the foot of Mt. San Antonio. The museum is equipped especially for work in biological science, possessing 250,000 zoölogical specimens and an herbarium of 200,000 sheets of plants. Three scientific journals are published in the interests, respectively, of economic botany, entomology, and astronomy. The college is coeducational and non-sectarian. Its enrollment in 1911 was 384 students in the four undergraduate classes. Affiliated schools of music and of art and design are conducted; the preparatory school has been discontinued. The faculty numbers 38, the alumni 430.

M. E. C.

PONDICHERRY. — See FRENCH COLONIES, EDUCATION IN.

PONS. — See NERVOUS SYSTEM.

POOLE, JOSHUA (*fl.* 1640). — An English schoolmaster, subsizar of Clare Hall, Cambridge, where he graduated M.A. From the *English Parnassus* it appears that he kept a private school in the house of Francis Atkinson at Hadley, near Barnet in Middlesex. Poole was the author of *The English Accidence or a Short and Easy Way for the more Speedy Attaining to the Latin Tongue* (1646), and of the *English Parnassus or a Help to English Poesie, containing a Collection of all the Rhythming Monosyllables, the Choicest Epithets and Phrases with some General Forms upon all Occasions, Subjects, Themes, Alphabetically Digested* (issued posthumously in 1657). The preface contains a "Short Institution of English Poetry," signed J. P., in which another work, the *English Rhetorick*, is promised, but does not appear to have been published. A list of "The Books principally made use of in the compiling of this work" (the *Parnassus*) is given and shows a wide acquaintance with English poetry. An "Alphabet of Monosyllables" precedes the main part of the work, which is divided into two sections, alphabetically arranged, giving a list of epithets, and of phrases and quotations appropriate to the various terms.

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POOLE, WILLIAM FREDERICK (1821–1894). — American librarian; was graduated from Yale College in 1849. While a student in college he was librarian of the "Brothers in Unity," and began the admirable *Index of Periodical Literature* (the first edition published in 1848), by which he is so well known. He was assistant librarian at the Boston Athenæum in 1851; librarian of the Mercantile Library of Boston from 1852 to 1856; librarian of the Boston Athenæum from 1856 to 1869; he organized the libraries at Waterbury, Conn., St. Johnsbury, Vt., and Newton, Mass.; also the library of the United States Naval Academy at Annapolis and the Newbury Library at Chicago. He was one of the founders of the American Library Association (*q.v.*), and for several years its president. His publications include the *Battle of the Dictionaries* (1857), a number of works on American history, and many papers on library science.

W. S. M.

POOR LAW AND EDUCATION. — The large amount of child pauperism in England and Wales has kept Poor Law Guardians constantly aware of educational problems. Though the number of children in receipt of relief has considerably fallen since 1870, when they numbered 400,000, the total still keeps somewhere in the neighborhood of a quarter of a million and constitutes from 25 to 30 per cent of the whole volume of pauperism. After 1871, however, there was a great "tightening up" of administration with regard to outdoor relief, and the subsequent decrease has related wholly to that class. The children receiving indoor relief have considerably increased. The latest figures, given in the last report of the Local Government Board, are those for Jan. 1, 1910. There were then 254,411 children under sixteen years of age who were in receipt of relief, 70,316 being indoor and 183,095 outdoor paupers. About three fourths of these children are between the ages of five and fourteen, thus coming under the classification of children of school age, since they are within the limits of the compulsory education acts. The education of these, however, is not wholly provided for by poor law authorities, which accept the direct responsibility of teaching with regard to a small minority.

Authorities dealing with Poor Law Education. — The central authorities in inverse order of importance are: (1) The Home Office, which has charge of reformatories and industrial schools (*q.v.*). Home Office inspectors deal with both classes of institutions, and grants are given in respect of children committed to them through the courts.

(2) The Poor Law Division of the Local Government Board supervises and regulates the arrangements made for the care of children by any local poor law authority, or combination of poor law authorities, or of poor law and other local governing authorities such as the Metropolitan Asylums Board for London. It also certifies schools and other institutions not under the control of poor law bodies as being fit to receive pauper children. But in the case of all these institutions, poor law and certified, the inspection of the actual teaching is now in the hands of the Board of Education.

(3) The Board of Education is the central authority for public elementary, secondary, and technical education, and, as has already been said, inspects poor law and certified schools with regard to the teaching given therein, though nothing else. This arrangement was not adopted until 1904. Since 1862 special poor law inspectors of education had been employed by the Local Government Board. Before 1863 poor law schools had been inspected by officers of the Education Committee of the Privy Council, then the central authority for education, which had given grants to these poor law institutions. When the work was handed over to the Board of Education in 1904, the list of schools inspected was far from being a complete one, and the inspection of certified institutions not receiving grants from the Board is still incomplete. Some few certified schools, however, governed by voluntary associations and receiving poor law and other children, had even before 1904 placed themselves under the supervision of the Board as public elementary schools in order to receive grants from the national exchequer.

The complexities of the system and the dual authority of education and poor law authorities may be further cleared up by noting the local public authorities responsible for the administration of these various institutions. These are: —

(1) The education committees of county and certain borough and urban district councils which establish and administer all the various classes of schools coming under the heading of industrial schools, public elementary schools, including truant schools, physically and mentally defective schools, and public secondary, trade, and technical schools.

(2) Boards of Guardians of Parishes and Unions of Parishes, Joint Boards, and the Metropolitan Asylums Board (made up of poor law and municipal representatives) which look after all poor law schools and homes and other institutions for children. It may be noted also that the Metropolitan Asylums Board has under its charge some remand homes for children awaiting trial in London, and a training ship for poor law boys as well as various convalescent homes and institutions for defective children.

(3) Voluntary associations — mostly in connection with religious bodies — which govern industrial and certified schools and homes for various classes of children, including those in receipt of poor law relief.

It is therefore obvious that the education of even indoor child paupers is already to a large extent in the hands of other authorities. The Home Office has supervision of a handful of poor law children in its industrial schools (*q.v.*), and the education authorities are responsible for the majority of the remainder. The children of school age on outdoor relief, whether living in their own homes or boarded out, attend the public elementary schools, and so also do many on indoor relief, who live in workhouse or other institutions established by the Guardians or certified by the Local Government Board. Thus in 1910, out of 45,382 children between the ages of three and fourteen[1] in poor law establishments, 21,766 were in attendance at public elementary schools.

The work of the two authorities is therefore very closely connected, especially since the Board of Education has taken over the duty of inspecting even those poor law schools for which the Guardians are directly responsible.

Poor Law Administration. — This is bound up in the long and varied experience of Outdoor and Indoor Relief, which forms so large a part of English economic history, but which cannot even be summarized here. (See reference list.)

Types of Institutions. — At the present time, therefore, the children for whom the Guardians admit full responsibility are dealt with in the following ways (L. G. B. *Report*, 1909–1910, pp. xxi–xxii. Fig. Jan., 1910): —

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[1] Poor law authorities regard the school age as extending from three to fourteen years. The education authorities make school attendance before five voluntary only, and are not bound to provide school places for children below five years of age.

I. Children in receipt of outdoor relief.		
(*a*) Boarded out within the union of chargeability	6890	
(*b*) Boarded out without the union of chargeability	1923	8813
II. Children in receipt of indoor relief.		
(*a*) In establishments under the control of the Guardians: —		
i. Workhouses and infirmaries	24,298	
ii. Metropolitan Asylums Board establishments, not including fever hospitals	2,944	
iii. District and separate schools, cottage, scattered and receiving homes		32,592
iv. Other institutions[1]	21	59,855
(*b*) In institutions not under the control of the Guardians: —		
i. Institutions for physically defective children	894	
ii. Hospitals and convalescent homes	428	
iii. Training and industrial homes and schools	9058	
iv. Other institutions[1]	81	10,481[2]
Total		79,149

Boarding Out. — The boarding-out system has much to recommend it and at its best is a successful effort to give to a destitute child the friendly surroundings of a home. Under the various orders issued from time to time by the Local Government Board it is now permissible for children to be placed by the Guardians with foster parents both within and without the union to which they belong. Conditions have been laid down to secure that the foster parents can provide sufficient houseroom, are of good character, and not so poor as to be under any temptation to deprive the children of proper provision. They must not have many children of their own and they must submit to supervision by both local committees and the women inspectors of the Local Government Board. Regulations are less strict for those "boarded out within," and this probably accounts for the greater number and less satisfactory condition of these children. The payment recognized by the Local Government Board is from 4*s.* to 5*s.* a week, — a noticeably high amount when compared with the sums paid for children living with their own parents. The education of these children is intrusted to the public elementary school, where they mix freely with others of their own age. The Guardians usually select homes in healthy country surroundings, — boarding out in London and large urban centers being forbidden, — and on the whole the scheme has worked very well, though the number of suitable homes and suitable children is necessarily small and the system is not capable of great expansion.

It has, however, one great difficulty. The children finish school at fourteen and the Guardians have to find some immediate footing for them so that they may support themselves. The girls are almost invariably sent to service, and the boys very frequently become farm laborers. The great object is to get them to work for some one who will house them, and undoubtedly the children of exceptional ability, well-defined tastes, or marked backwardness are at a great disadvantage.

(For boarding out and its difficulties see *Report* by Miss Mason in *Report* of L. G. B., 1909–1910, Pt. I, pp. 97, *et seq.*)

Institutions under the Control of the Guardians. — When dealing with children in establishments under the control of the Guardians it is difficult to make use of the only classification furnished by the L. G. B. Scattered homes, for example, have little that is akin to cottage homes; and receiving homes, especially with regard to teaching, are often scarcely to be distinguished from receiving wards in the workhouse itself. But the number of children in each class of institution is unfortunately not available, and they must be dealt with in this rather confused classification.

Children in Workhouses and Infirmaries and M. A. B. Homes. — About three to four thousand of these are infants under three years of age, and many others are convalescent or ill. Only 388 are now in workhouse schools, and these are in fourteen unions. The greatest number in any one school is ninety-two, and thirty may be taken as the average. The evidence of all investigators goes to show that such schools are badly arranged, ill-equipped and poorly and insufficiently staffed. Whether the appointment goes to a good-tempered young lady who lives outside the workhouse or to an official within, the results are equally poor and the teaching equally uninspiring and depressing. The curriculum is commonly restricted to the three R's, and the poor teacher has to deal at the one time with a dismal band of children of all ages, sizes, and stages of knowledge. Worse still, the children in such circumstances live their whole time in the workhouse precincts, seeing no other than workhouse children.

Whether education is provided for on the premises or whether, as in the majority of cases, the children go out to the public elementary schools, the workhouse still has them for the greater part of every week day, for every Saturday and Sunday, and for holidays. Holidays, indeed, are rather frequent, for newcomers are continually bringing infectious disease to the children's wards and long periods of quarantine find them all in dismal idleness under the care of that favorite childminder of the workhouse, the old pauper of good character. Industrial training of some sort is usually given — for the most part in cobbling and tailoring, washing and sewing, and the industrial trainer often acts as caretaker in leisure hours. Efforts may be made to keep the children apart from the adults, but they are always doomed to fail. The worn-out old people, the wrecks of middle and early life are there, and the children cannot be kept from contact with them. Often they all dine together; sometimes boys or girls sleep in adult wards; or they may work together at the same task. The girls and little boys may live in the nursery with the babies, the old pauper grannies who tend them, and the mothers of all classes and characters who suckle them. Nothing is clearer to all concerned than the need of taking every child out of the general mixed workhouse, — but the child is still there.

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[1] No further information is given as to these children.

[2] 8608 of these children are in certified institutions.

The children in sick wards of workhouses, as well as those in the Metropolitan Asylums Board homes for convalescents, are of course in a different position. Here regular education of the ordinary type is impossible, though in the establishments for ringworm and ophthalmia regular schools are carried on. It is, however, a great pity that, when education authorities are experimenting in open-air schools, the poor law authority does not aid them by developing the same system for children in convalescent homes, many of whom are merely weakly and ailing and are often there for long periods. At present, even in the largest of these, education is left to the visits of kindly volunteers who, being without teaching experience, naturally find the task a hopeless one, and all this happy opportunity is lost.

District and Separate Schools, Cottage Homes, etc. — Of the district schools there are not many now left, and the largest number of children in any one school is 877. All together there are six of these institutions under the management of joint boards composed of representatives of several unions, but in many of the separate schools or cottage homes "boarders" are taken; *i.e.* children from other unions without schools of their own are admitted. The largest of the separate schools accommodates 750 children, but the usual number is about half that. It is curious that in poor law schools the number of girls is less by one sixth than the number of boys. No figures are available which would show whether this is so with regard to child pauperism generally, but it seems probable that it is chiefly so in regard to indoor pauperism. A widow asked to give up some of her children will be more likely to keep with her the girls, who are more useful at home and less "rackety" than the boys, while an orphan girl finds a home with a relation or a friend more easily than a boy. Such rescue from the taint of pauperism may not always be an advantage to the girl, who may find herself turned at a very early age into a little orphan drudge expected to give many hours of grateful washing up and sweeping and minding of the baby in return for her keep.

Leaving aside, for the present, the scattered homes and the receiving homes, the three remaining types may be shortly described.

(1) *The "Barrack" School.* — The typical features of this are large block buildings with large dormitories, sometimes containing as many as a hundred beds, a large dining hall, and in general the "mass" method of treating the children with the necessary corollary of a machine-like exactitude in all the details of daily life.

(2) *The partially "Barrack" School.* — In this case there is the same style of block building, but the blocks themselves are divided up. Meals are taken in the one dining hall, but the dormitory system is not adopted. The children are grouped in small numbers, each group having its own section of bedrooms and playrooms and each group, therefore, being able within general limits to develop some individual differences and to have some escape from routine. At the same time the communal spirit of the school is developed by all taking meals together and sharing the one playground. In such schools the children are usually grouped by ages, and young and old are not mixed. The whole organization is akin rather to the middle-class boarding school than the public orphan asylum.

(3) *The Cottage Home.* — Here the model is the home and not the school. The children are grouped in cottages or small blocks, with from eight to forty in each. See ORPHAN EDUCATION.

In any of these types the school may be under the management of the Guardians, or the children may go out to a public elementary school or may even be divided between the two kinds of establishment. The youngest of the children, those from three to five years old, are seldom admitted to the elementary school, and for them therefore the poor law must provide. The trained infant teacher is unfortunately rare and unfortunately again the untrained disciplinarian who drums their letters and their figures into them is more common than the equally untrained motherly woman who takes them to play in the fields and teaches them singing games. However, in the best of the schools the newer methods of infant teaching are growing up.

In other poor law schools the children receive instruction in the institution until they reach some particular standard, *e.g.* standard 4, and after that they attend a public elementary school. This is a peculiarly bad method because in these "partial" schools the equipment and teaching are very poor, the classes large and often more than one to each teacher. Thus the children tend to be backward, and when they do reach the outside school, they are behind those of their own age and at a disadvantage in learning.

Still another mixed class of education is to be found in those which send their children to the education authority's school for the ordinary hours and provide industrial classes in the poor law institution out of hours.

(4) *Scattered Homes.* — These are a further extension of the home idea. Houses are

taken, if possible scattered about in a working-class district, and children in numbers from eight to twenty are placed in them under the charge of a foster mother. Their education is altogether obtained at the public elementary schools and, save that they are well housed, comfortably clad, and sufficiently fed, their lot in childhood is fairly comparable to that of their neighbors with whom they mix freely. In these scattered homes, however, the Guardians have practically nothing to do with the teaching arrangements for the children.

(5) *The Receiving Home.* — These have been established in several unions to serve a double purpose. In the first place they are used as quarantine for the children to be admitted to the schools. In the second place they are used as a net to catch the "Ins-and-Outs." These are the children of parents who are constantly coming into the workhouses and after short intervals taking their discharge. The law requires that their children should go with them and it can easily be imagined what a disturbing influence these children constitute in the poor law schools. Without the receiving home, or as it is also called the intermediate school, such children form a constant source of disturbance at the permanent school, and where provision is made, children of known "Ins-and-Outs" and temporary paupers are never taken on to the permanent schools at all. Many children, therefore, spend their school life alternating between the receiving home and the streets. (See interesting account of these children in the *Minority Report,* chapter on children.) As the former provides as a rule only a stop-gap form of education, the children learn very little, but the schools are in some instances among the best of poor law institutions. They show every variety, however, from one in which the school, though within a poor law building, is under the control of the education authority to one where all the children of all ages have instruction every morning from the assistant matron.

In unions without receiving homes the necessary period of quarantine is passed either in a separate building forming part of the school or in the receiving wards of the general mixed workhouse itself, or its nurseries. In the receiving wards the children are usually in the charge of the porter and his wife, and though attempts are made to place them in separate wards, it is usually impossible to keep them successfully out of contact with the drifting mass of adult pauperism passing in and out. No worse introduction to a new phase of a child's life, just at an impressionable moment when some catastrophe has brought it into the hands of the poor law, can be imagined than the dismal atmosphere of the receiving wards with their continuous stream of unhappy and degraded men and women.

Education and Instruction. — Until 1897 the education in the poor law school had been divided in equal parts between ordinary instruction and industrial training. By an order of the Local Government Board, of January, 1897, this half-time system was abolished for children who had not passed the fourth standard or reached the age of eleven. This leaves it less open to the Guardians to withdraw the children from school work, and the practice in different schools varies according to their educational enthusiasm. In some, children are withdrawn from school altogether at thirteen. Others are beginning to encourage them to compete for scholarships given by the education authorities and to maintain them when they win. Such cases are exceedingly rare and have gained much public notice. On the whole, book learning is rather despised by the Guardians as unpractical and not assisting a child to make his living quickly.

Partly because of this and partly because there are so few poor law schools that the service offers little in the way of promotion, and partly because the Guardians are just beginning to realize the need of highly trained teachers, especially for the chief posts in their schools, the poor law service does not attract the best men and women in the teaching profession. The posts have improved since the time when the teachers in the earlier "barrack" schools were required to look after the children day and night. The great majority now are in residence at a separate building or live outside the school altogether. Still it is to be noted that taken all round the staff is of poorer quality and fewer certificated teachers are employed in the poor law service than in the public elementary schools. This is even more marked with the industrial teachers. In most cases they are the house mothers and fathers in the cottage homes or the caretakers of the children in the block dwellings, and the difficulty of finding good teachers is complicated by the need of finding in them also suitable officers for these other duties. For the most part, therefore, they are men and women who, whatever their knowledge of a particular trade may be, are not teachers either by experience or training.

The industrial training is of great importance because the children's future depends upon it. For the boys, the most usual trades are tailoring and bootmaking, and less often, gardening, carpentry, and baking. The brass band is also a notable feature at every poor law school, but only those boys are taken into it who are willing to enlist later on in the army or navy.

The opinion of the inspectors of the Board of Education is that the industrial training of the boys, whether as half-timers or as whole-timers, is too much sacrificed to the needs of the institution. Cobbling the school's boots, mending the school's clothes, making the school's bread, and weeding the school's garden is too often the aim rather than the thorough teaching, practical and theoretical, of the trade concerned. (See the *Report* above, p. 21.)

For the girls this is even more true. Their industrial training is always directed to the one end, that of making them domestic servants, for which there is always the demand and by which means they can become immediately self-supporting. Obviously, the temptation to train them by giving them the work of the institution to do is a great one and more or less all the Guardians fall into it. Occasionally they may be well taught, though their teaching is always of the practical and unintellectual description, but certainly they have a large amount of dull drudgery which the boys escape. The complaint against the "barrack" schools was that all the work was done on the factory system, labor-saving machinery being necessary with such large numbers, and that therefore the girls learned nothing of the way in which the work of a small household was carried on. The complaint with regard to the cottage homes is that the girls learn too much of the wasteful drudgery which characterizes the housework of the poorer middle class of to-day with their preference for cheap human labor rather than the simplest machine. It is usual for the two elder girls in each cottage to help the house mother in all the work, spending their whole time in cleaning, sewing and mending, washing and dressing the youngest children, and doing part of the laundry work and cooking, and in all these departments doing as a rule only the simpler but most tiresome operations.

There are two general criticisms of poor law schools, one strictly educational, the other perhaps more of a social nature. The first is that the schools, being very few in number, allow no scope at all for intelligent classification. Poor law children do not differ in kind from the rest of the child population and therefore show an infinite variety of types, requiring for their best development an infinite variety in their treatment. Probably the proportion of neglected and backward children may be a little higher than is normal, but even that is doubtful; and the regular food and good physical surroundings of the school would be expected to alter it very quickly. But the system provides practically no possibility of variations. There is the one small staff of teachers, the one class of school, the one range of trades to choose from. All the children must pass through the same mill, the brilliant and the dull, the normal and the defective, all share the same routine. The cleverer the child, the more quickly it passes through its standards and becomes a half-timer and finally a full-timer. Even the trade it learns is chosen just as much because there happens to be a vacancy in this or that workshop at the moment, as because the child has a talent for shoemaking or tailoring. The result is that the level of attainment in a poor law school is very low and that there are few children in the higher standards. In the public elementary school, on the other hand, they do far better because there is some effort there to classify the children according to type. Thus in a poor law school it is usual to find in all the lower standards a sprinkling of defective children, who, instead of receiving special teaching, get along with the others as best they may, keeping the whole class down to the level of their own stupidity. There is also the deplorable mixture of the big children, who have been neglected all their lives and escaped the school attendance officers, having to sit in the poor law school side by side with the infants. This lack of classification necessarily lowers the whole standard of the instruction given and forms a cause of great depression to the unfortunate teachers, who find their classes loaded with defective or backward children.

The second criticism is that the life in the schools has too little relation to the life outside to form a really satisfactory foundation for the children's future. The complete separation of the bigger girls and boys, which is customary, no doubt makes management easier, but it certainly makes the school life artificial. The ordinary child who goes to boarding school has at least holidays at home, where there are brothers and neighbors. The poor law child has no home but the school. There are beginnings of a more liberal spirit in these matters, and some Guardians have even arranged for a yearly trip to the seaside for all the children, though here again the boys and girls go separately. But in some schools there is a freer intercourse, and the children of fourteen and fifteen are being allowed to go about more freely and to undertake greater responsibilities. The older girls in some homes, *e.g.*, are sent shopping and thus are gaining something of that sense of the real importance of things which the handling of money gives. It is unnecessary to point out that when the children attend the elementary schools and mix with others, they gain far more knowledge of the world than they could within the bounds of an unmixed poor law school.

Children in Institutions not under the Control of the Guardians. — The third division only is of importance here. A few of these are homes for children over school age who are difficult to manage and cannot be found places, but nearly all are the certified schools which have been mentioned above. These are largely Roman Catholic and managed by religious orders. They take a very high place with regard to athletics, but on the whole are much like the poor law schools. It should, however, be noted that there were in 1908 as many as 269 certified schools, and that only sixty-one of these were being inspected by the Board of Education. It is therefore impossible to say anything of the education given in the remaining 208, some of which are homes only, with no schools attached. (See *Report* to the Board of Education by Tillard and Synge, above, and *Minority Report*, chapter on children.)

Cost of Maintenance. — The cost of indoor treatment of pauper children is by no means slight. The cottage homes cost from £100 to £250 capital expenditure and from £30 to £55 for each child annually. The cost of children in the workhouse has not been distinguished from that of other inmates, but it may certainly be reckoned at something less than £25. The scattered homes cost from £18 upwards, and the schools vary upwards from £25 to £50. In the "certified schools" the charges made on the Guardians are lighter, the children costing from £12 to £18 a year.

After Care. — It only remains now to touch upon the question of the after care of the child pauper. By law Poor Law Guardians may pay for apprenticing the child of any poor person within the parish — whether he be a pauper or not. But this law, introduced in accordance with the recommendations of the Poor Law Commissioners in 1834, has been a dead letter. The Guardians have restricted their attention altogether to the boarded-out and indoor pauper children, and these alone have shared in these benefits. The apprenticeship for which the Guardians are permitted to provide premiums is the old-fashioned indoor apprenticeship which has almost ceased in England. So far as it is still carried out, boys are apprenticed to the small employer, who, with old-fashioned tools and much hand labor, carries on the work, *e.g.*, of the shoemaker, blacksmith, tailor, or carpenter. The amounts paid in premiums are exceedingly small and the field is thereby narrowed still further.

It is, therefore, no wonder that other ways of dealing with the poor law boys have been instituted. For some who are learning trades in the ordinary way or for those who go into offices, Boys' Homes are being made use of, and the Guardians in rare cases have established or are about to establish these for themselves or are making use of voluntary institutions. Farm service absorbs some lads, others go into coal-mines or to the trawlers, while a large number are enlisted in the bands of the army and navy. Through the *Exmouth* training ship, a good number go into the mercantile marine as well as the navy. Out of the 668 boys placed out by the Guardians of London unions in 1909 from district, separate, certified or other schools, 159 went into the army and navy, — more than twice the number who went into any one trade, — and 58 went into the mercantile marine. Other employments included: farm hands, gardeners, etc., 69; shoemakers, 44; domestic service, 34; bakers, 32; office boys, shop and errand boys, 30; tailors, 21; etc. In addition to these, 140 were sent to Boys' Homes to be found work from there. Unfortunately, similar figures are not available for other areas, but there is no reason to suppose, apart from local variations due to predominant trades, that many changes occur.

For the girls, the only future is that of domestic service. Out of 600 girls in the London area placed out in one year, 582 became domestic servants, and the remaining 18, though not so classified, have taken situations little different in kind. Sixteen are laundrymaids, dairymaids, children's maids, and helpers at cottage homes. One has become a teacher to the blind, and one a lacemaker. It is usual to find that only defective girls, mentally or physically defective, are not sent to service.

Once sent out into the world, the great difficulty of poor law management is to keep them there. Except for some supervision of indoor apprentices, the poor law intrudes as little as possible, and the children are either left without any supervision, are occasionally seen by Guardians or officials, or are handed over to voluntary associations (where such exist) like the Metropolitan Association for Befriending Young Servants. It is recognized that the success in life of the young people depends on the seeming absence of all connection with pauperism — but it is impossible to exercise responsibility and hide all traces at one and the same time. A further difficulty lies in the fact that children who at sixteen years have been found no occupation or have lost a place provided for them, can no longer be kept in any poor law institution but the general mixed workhouse, and it is to this that even the young servant girl will have to return in any interval between her places. Probably a more unsuitable home for a young girl could not be found than the women's wards which constitute her only certain refuge. Once having spent some time there, she is unlikely to return to an independent position in useful work.

It will be seen that throughout the dealings of the poor law with destitute children, the one uniform tendency is to push the poor law farther and farther into the background. The education authorities, the Home Office, and voluntary organizations are more and more taking up the work. The best Guardians, throwing aside the old principle of "lesser eligibility," have tended to place the education of their indoor pauper children in the hands of the education authority and their after care in that of voluntary organizations; or if not this, they have at least placed the children both during and after school life in homes as far as possible from the hated workhouse. The outdoor relief children, never educated by the Guardians, are now coming under the education authority, not only for teaching, but for feeding and medical attention as well.

The whole development of the treatment of destitute children points to the fusion of the poor law, so far as it deals with them, with the education authority whose responsibility for the welfare of the future of the nation through its care of the children of to-day is being continuously and almost unconsciously increased from day to day. Such a fusion would not only simplify present methods and satisfy the desire for logical treatment of an administrative problem, but would make it possible to bring about many improvements in the care of destitute children for which Poor Law Guardians have for many years striven in vain.

M. P.

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POOR, SCHOOLS FOR. — See Poor Law and Education.

POPULAR EDUCATION. — See Public Education.

PORPHYRY. — See Neo-Platonism.

PORSON, RICHARD (1759–1808). — English scholar and Regius Professor of Greek at Cambridge. He was the son of the parish clerk at East Ruston, Norfolk, and early showed such ability that a patron undertook to send him to Eton. Later, a fund was raised by old Etonians to send him to Cambridge, where he entered Trinity College in 1778, obtaining a scholarship in 1780. In 1782 he obtained a fellowship, and in 1785 he proceeded to the M. A. Refusing to take orders, he was compelled to resign his fellowship in 1792, the year in which he was elected Regius Professor of Greek. For a long time he was in great financial straits, although friends had raised a fund to give him an annuity. In 1806 he became principal librarian of the London Institution. He died in 1808. Porson's only interest was in study and scholarship. As professor at Cambridge he never delivered a single lecture and lived in London most of the time. His literary activity was limited to the twenty years from 1783 to 1803, beginning with a number of reviews. In 1790 he attracted attention by the *Letters to Travis*, proving the spuriousness of 1 St. John v, 7, and by his preface to Toup's *Emendations on Suidas.* In 1797 he published an edition of Euripides' *Hecuba*, in 1798 the *Orestes*, in 1799 the *Phœnissæ*, and in 1901 the *Medea*, the only one issued under his name. In a second edition of the *Hecuba* (1802) he wrote a valuable supplement dealing with the Greek meters. Porson had also laid the foundations for editions of Æschylus and Athenæus. His remains were published later by his friends. Porson's contribution to English scholarship was to introduce high standards of scholarship and accuracy in textual criticism, which influenced Cambridge for more than fifty years after his death.

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PORT ROYALISTS. — The name given to a community of recluses, established by Jean Baptist du Vergier d'Hauranne, Abbé de St. Cyran. St. Cyran (1581–1643), as he is usually called, was a friend of Cornelius Jansen (1585–1638). The two, Jansen and St. Cyran, were especially united, from their student days, in a common devotion to the writings of St. Augustine (*q.v.*). St. Cyran was a native of Bayonne; and met Jansen (of Dutch birth) as a fellow-student either at Louvain or Paris. In 1611 the two friends retired to Champré, a house by the seaside near Bayonne, determined to follow the example of the schoolmen, by going to the fountain head of theological patristic knowledge, in St. Augustine. At Champré they remained together for five years in the closest study. In 1620 St. Cyran was made abbot of the abbey of that name. In the same year he first met M. d'Andilly Arnauld, and "from that moment," Arnauld said, "our friendship began, and, up to the time of St. Cyran's death, continued to be as complete as it is possible in this world for friendship to be." The connection between Jansenism and Port Royal can now be made clear. St. Cyran and Jansen were thoroughly permeated with Augustinian theology. St. Cyran, though separated from Jansen, was still in the fullest sympathy, and in close correspondence, and passed on the Augustinian views to Arnauld, while Arnauld's sister, the Mère Angélique, the abbess of Port Royal, was drawn to making St. Cyran the spiritual director of herself and her convent. Thus the Jesuits characterized the origin of Port Royal des Champs: *Paulus genuit Augustinum; Augustinus, Calvinum; Calvinus, Jansenium; Jansenius, Sancyranum; Sancyranus, Arnauldum et fratres eius.* In 1626 la Mère Angélique had left Port Royal, in consequence of an outbreak of fever. It was afterwards, in 1637, occupied by "solitaries," a brotherhood who wished to give themselves up to the leadership of St. Cyran and to devote themselves to prayer and study. Amongst these were M. le Maître, distinguished as a lawyer; the teacher of Racine the dramatist; M. de Sercourt, prominent as a soldier; M. de Saci, trained for the Church, who became, after Singlin, the successor of St. Cyran; the spiritual director of Pascal, the most brilliant writer of the Port Royal. The most active member of the brotherhood was Antoine Arnauld (*q.v.*), nephew of D'Andilly, and son of the celebrated advocate, Antoine Arnauld, who defended the University of Paris against the Jesuits in 1594. Along with these members of the Port Royal brotherhood were such men as Lancelot, Fontaine, Nicole, Guyot, Coustel, — names of high importance in educational history. Such a galaxy of illustrious men probably never issued from so small a community as Les Messieurs de Port Royal des Champs, and it is significant that men of such high standing, both socially and professionally, when brought face to face with the problems on the highest spiritual plane, realized the necessity of the keenest attention to education.

Educational Work. — In his chapter on *Les Messieurs de Port Royal*, Dr. Charles Beard describes the daily life led by these gentlemen monks, erstwhile courtiers and men of the world, from three in the morning till the night, and their occupations in religious devotions, in four hours' hand labor, in severe self-denial and discipline, works of charity and of piety, besides the participation in special work for which there was special ability in the individual, or special need for the community. Education was particularly marked out by St. Cyran as a special need to be supplied by these "solitaries." St. Cyran was full of affection for children and established schools which he called *Petites Écoles*, a term which might show that the Port Royalist schools were without the pretentiousness of the Jesuits, who aimed at competing with the universities. He suggested six as a suitable number of pupils for a *Petite École*, for which number he desired a Latin master and a good priest. It is said that St. Cyran always showed a respect to children, "that in them he might honor innocence and the Holy Spirit who dwells with it." But, on the other hand, he was ready to speak sharply to the pupil reading Vergil, for Vergil had procured damnation by writing for vanity and glory, and tell the boy that he must try to save himself by only reading such authors by whom he would fit himself for the better service of God. He thought the bringing up of children in piety was the greatest of human charities (after dying for another's good), and that in death the greatest consolation must be the thought of having contributed to the good education of some child. The three necessary maxims for training children were: to speak little, bear with them much, and pray more. He realized that teachers should have the more love for those who are unformed and backward. Punishments were only to be resorted to after every effort of love had failed. With the good teacher it will seem necessary *plus prier que crier*, to speak more of them to God than of God to them. Claude Lancelot (*q.v.*), the devoted Port Royal schoolmaster, says St. Cyran set everybody, on every opportunity, to teaching. Lancelot joined the community in 1643 on the death of St. Cyran.

Lancelot was the greatest of the rational educationists, not only of the Port Royalists, but from the standpoint of linguistic teaching of all the teachers of the seventeenth century. Antoine Arnauld and Pierre Nicole were greater thinkers, but without so keen a grip of the methods for learning languages. These latter two were the joint authors in 1660 of the *Grammaire générale*. Lancelot, in writing his methods of linguistic teaching, noted some of his difficulties and consulted Arnauld. The work has no marked pedagogic characteristics, but it has its place in the development of the study of comparative grammar.

Arnauld's rôle, educationally, was that of suggester rather than of writer. In 1662 he again took part with Pierre Nicole in a joint production, viz. the famous *La Logique, ou l'Art de Penser, contenant, outre les Règles communes, plusieurs Observations nouvelles, propres à former le Jugement.* Arnauld undertook to impart in four or five days to the Duc de Chevreuse all the logic worth knowing. The work includes a treatment of the principles laid down in the *Discours de la Méthode* of Réné Descartes (*q.v.*). The introduction of the Method of Descartes requires to be noted specially, for the Jesuits had assailed his system of philosophy, and the acceptance of his views by Port Royalist writers was calculated to court the further enmity of the Jesuits. The whole tendency, however, of the Port Royalists, educationally, was very largely represented in Descartes' views, not only in the acceptance of common ground in the foundation of educational method, but in other points, as, for instance, in the comparison between the ancients and the moderns. Descartes had taken up the side of the moderns, even urging that there should not be blind following of the ancients in questions of literary taste and standards, and such a position helped the Port Royalists in their advocacy of the vernacular, and the whole tendency of the new views with regard to the value of the vernacular made Racine's influence possible, in and through the French language, while the whole cause of the extension of philosophy and science was promoted by Descartes' use of the vernacular French in his treatise on method. The direct influence of philosophy on educational method had thus never been more strikingly illustrated than by the way in which the Port Royalists and other reformers applied Descartes' principles and followed his example.

Pierre Nicole had written a Latin textbook, *Epigrammatum delectus* (1659). This was a logical result of the Jansenist religious position — for its object was to omit from the selection of epigrams those of Martial and Catullus and others, which were morally unsuitable matter for youthful or, for that matter, for adult consideration. It was a school textbook which had a very wide circulation both in France and elsewhere. Nicole also wrote the *Essais de Morale* in six volumes, which Voltaire declared would "never perish." They contain no systematic scheme of ethics; they are, moreover, full of images expressing "the mean wretchedness of man and the eternal blackness of his fate." Among Nicole's *Essais de Morale* is the *De l'Éducation d'un Prince*. Nicole seizes on the point that, at the best, masters do nothing but "expose the things [of knowledge] to the interior light of the mind by which alone they can be understood."

Other Port Royal educationists were Guyot and Coustel. Thomas Guyot was the writer of a number of translations from the classics into French, and thus was important in the status given to French in education. He translated the *Captivi* of Plautus in 1666; Cicero's *Letters to Atticus* also in 1666; other letters of Cicero in 1668; the *Bucolics* of Vergil in 1676. He published a collection of *Epigrammatic Flowers from Ancient and Modern Writers* (1669). Coustel in 1687 drew up *Rules for the Education of Children* described by Félix Cadet, as "the most complete and methodical work of Port Royal on pedagogy that remains to us."

Finally, for the education of girls there were the *Constitutions* of the monastery of Port Royal, and the *Regulations for the Children* of Port Royal, drawn up by Jacqueline Pascal, sister of Blaise Pascal.

Schools. — The Port Royal schools were very small in numbers, ordinarily from twenty to twenty-five; only once they numbered fifty. Each master had only five or six boys in charge, day and night, the number being arranged so that a master should have no more pupils than the number for whom he had space in his own bedroom. As early as 1637 Singlin, on the suggestion of St. Cyran, had received two or three children at Port Royal des Champs. The numbers afterwards were increased. In 1644 the children were removed to Le Chenai, near Versailles. They then returned to Port Royal, but in 1646 were removed to a house in the Rue St. Dominique d'Enfer in Paris, when the school was fully organized with the four masters, Lancelot, Nicole, Guyot, and Coustel, each of whom had a room with six scholars. In 1653 the schools were removed from Paris, and in 1660 they were finally closed by Louis XIV. The day's life and work in the schools is described in Dr. Charles Beard's *Port-Royal* (1861), Vol. II, pp. 140–141. In 1726 Charles Rollin's *Traité des Études* appeared, a work which summed up the best and most advanced pedagogical practice of the universities and colleges of the times. This treatise shows how far the methods of classical and linguistic teaching of the Jansenists had penetrated into the best practice of the following generations.

F. W.

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PORTER, NOAH (1811–1892). — Twelfth president of Yale University; graduated from Yale in 1831. He was for two years a teacher in the Hopkins Grammar School at New Haven and for two years a tutor at Yale. From 1835 to 1846 he was pastor of Congregational churches at Milford, Conn., and Springfield, Mass. He was professor of metaphysics and moral philosophy at Yale from 1846 to 1871 and president of the college from 1871 to 1886. His publications include *Educational Systems of the Puritans and Jesuits* (1851), *Human Intellect* (1868), *Books and Reading* (1870), *American Colleges and the American Public* (1871), *Elements of Moral Science* (1885), and *Kant's Ethics* (1886). He was for many years one of the editors of Noah Webster's *Unabridged Dictionary*. W. S. M.

See Yale University.

PORTO RICO, ISLAND OF. — An island, the easternmost part of the Greater Antilles group, bordering on the Caribbean Sea, and acquired by the United States as one of the results of the Spanish-American War of 1898. The island contains 3435 square miles, which is about three fourths the size of Connecticut. The island had a total population in 1910 of 1,118,012, and a density of population of 325 persons per square mile. For administrative purposes the island is divided into 66 municipalities, or townships. For purposes of school supervision these are grouped into a number of supervisory districts (43 in 1910).

Educational History. — The Spanish had helped to maintain some form of religious schools in the island for a long time previous to the American occupation. At this time the school system of Porto Rico consisted of 380 schools for boys, 148 for girls, or a total of 528, and with an attendance of 18,243 children. All of the schools, with one exception, were housed in rented buildings, which also served as living quarters for the teacher and his family. The schools were of the tuition type, with some provisions for pauper pupils, tuition being charged for all children whose parents or guardians were able to pay. Eighty-five per cent of the population of the island could not read or write. The course of study in the schools consisted of reading, writing, Spanish grammar, church history and doctrine, the elements of arithmetic, with weights and measures, the merest elements of geography, and an elementary outline of agriculture, industry, and commerce. A few days after the establishment of the American military government, a mass meeting at San Juan adopted resolutions asking for the establishment of a general system of public education, gratuitous and compulsory, and after the American type. Two months later, at the close of the year 1898, General John Eaton was appointed by the Secretary of the Interior of the United States to visit Porto Rico and to reorganize the school system. Early in 1899 he formulated a new school law for the island, and this was issued May 1, as a military order. General Eaton was made chief of the new Bureau of Education thus established. The new school law provided for a local school board of five members in each of the sixty-six barrios, or townships of the island, and defined the duties of these boards. A series of twelve military orders provided for the abolition of the fee system, and for free schools; a school year of nine months; a graded system of schools; not over fifty pupils to the teacher, and principals of schools; the salaries and the certification of teachers; free textbooks and supplies; fixed the legal relations of the barrios to their schools; and provided for a system embracing elementary, secondary, normal, and professional schools. One order also reformed the course of study. Church doctrine and religion were dropped, and the essentials of an American elementary course of study were substituted, with both Spanish and English as languages.

In August the insular Bureau of Education was abolished, and an insular governing board substituted. On May 1, 1900, this was superseded by the provisions of the Foraker act, establishing civil government, and a Commissioner of Education for the island, appointed by the President of the United States, succeeded to the control of the educational system of the island. At the first session of the insular legislature the new Superintendent, Dr. Brumbaugh, secured the enactment of a new school code. This, although somewhat amended since then, has remained as the basic school law of the island, and the present organization, in large part, follows the lines laid down in this code and is given, together with subsequent modification, in the following sections.

Present School System. — At the head of the present school system of Porto Rico is a Commissioner of Education, appointed by the President of the United States, for a four-year term. He has a seat in the upper house of the legislative assembly of the island. He also acts, *ex officio*, as President of the Board of Trustees of the University of Porto Rico (which here means practically as President of the University), and of the trustees of the insular library. He appoints all subordinates in the department, except certain classes of teachers. Aside from teachers and clerks, these consist of an assistant commissioner, a department secretary, a chief of the division of property and accounts, a chief of the division of school building accounts, three general superintendents, and a sufficient number of supervising principals (forty in 1910) properly to supervise the schools of the island. The Commissioner in person or through his subordinates is required to supervise all public education on the island; to approve all transfers of school funds and all disbursements for educational purposes; to prepare all courses of study; to determine the length of the school term; to approve all plans for school buildings; to approve nominations for teachers in the schools; and to have charge, through an appointed board of examiners, of the examination and certification of the teachers of the island. He organizes high schools and new educational undertakings, as appropriations permit, and makes an annual report to the Governor of the island.

The form of educational organization of the island is that of a small New England state, organized on the town or township plan, each town reporting to and being under the supervision of one central authority. The island is divided for purposes of civil government into sixty-six municipalities (townships), for each of which a local school board, consisting of three citizens elected by the people, for four-year terms, is provided. Each board elects a treasurer, who handles the funds. These boards have charge of the elementary school buildings of the municipality, erect and repair the school buildings, or rent buildings for school purposes, and pay teachers their house-rent grants, and, in the larger municipalities, their salaries also. Each board nominates, annually, to the Commissioner of Education the names of the teachers it wishes to employ, and, after his approval, proceeds to elect the same.

For purposes of school supervision the municipalities of the island are grouped into supervisory districts. At first the number was sixteen, in 1902 raised to nineteen, and by the law of 1907 changed to thirty-five, and provision for an automatic increase made. In 1910 the number was increased to forty-three.

For each of these supervisory districts a supervising principal is appointed, who acts as the immediate representative of the Commissioner. These receive salaries of $1600, $1400, and $1200, with an allowance of $240 additional for house rent, and $200 further for traveling expenses in districts consisting of more than one municipality. The supervising principal is *ex officio* a member of the school board of his municipality, with the right to speak but not to vote. He has an office, though he spends the greater part of his time in supervising instruction. He performs such duties as are assigned to him, and makes a monthly and an annual report to the Commissioner of Education. In 1909–1910 these officials averaged thirteen visits to each teacher for the year. The three general superintendents devote the greater part of their time to field work, such as consulting with school boards and supervising principals, conducting teachers' institutes and meetings, giving public addresses, and helping to organize school play grounds, school savings banks, and libraries. The assistant commissioner of education is at the head of the department of supervision, and to him the supervising principals and the general superintendents report.

School Support. — The support for the schools of Porto Rico comes from two sources, — insular appropriations and local (municipal) tax levies. For the last year for which reports are available, about 30 per cent of the funds came from local sources. This does not include the University of Porto Rico. The insular portion of the expenses consists of a large annual legislative appropriation for maintenance (salaries, administration, textbooks, summer schools, scholarships, — $851,000 in 1910), and supplemental appropriations for school extension work, school building loans, rural school purchases, and miscellaneous expenses. The municipal portion consists of funds derived from taxation and used for the rent of schoolhouses, the house rent of teachers, equipment and furniture, construction of school buildings, salaries of employes, and contingent and general expenses.

Teachers and Training. — The teachers of the island are divided into six classes: rural, graded, principal, English, special, and high. The first three classes are elected by the local school boards, after approval by the Commissioner. Graded teachers are divided into two classes, — those teaching in English and those in Spanish schools. The teachers of English, the various special teachers, and the high school teachers are appointed directly by the Commissioner of Education. The assistant commissioner, the three general superintendents, and the chief of the division of records constitute an Insular Board of Examiners, who certificate all teachers. The certification and supervision are thus kept closely united. Different certificates are issued for each class of teachers. With the development of the normal school, the number taking the examinations for rural and graded certificates is gradually decreasing. There is a uniform salary schedule, under which all teachers of the same class are paid the same monthly salary. This varies from $30 to $80 a month, with varying additional allowances for house rent.

The first teachers were American teachers, imported for the purpose. These have since been almost entirely displaced by native teachers, and the policy is to provide native teachers, whenever competent. For the training of future teachers, the insular government maintains the insular normal school at Rio Piedras, seven miles from San Juan.

Educational Conditions. — The school system consists of rural, graded, and high schools; night schools; and normal, collegiate, and technical instruction. The rural schools are by far the most numerous. Many of these are in rented buildings, and as yet poorly housed and poorly supplied with furniture and teaching equipment. The first rural schoolhouse was built in 1901, and by 1910, 192 one-room and 12 two-room rural school buildings had been built and were owned by the municipalities. This was 25 per cent of the schoolrooms in use that year. There were in the same year 671 rooms in town graded schools. Up to 1908 the rural schools offered only the first three grades of school work, but in 1908–1909 the fourth grade was added in most of the schools, and in 1909–1910 the fifth grade in quite a number, and in 1910–1911 the sixth grade, wherever demanded. A few centralized rural schools have been organized in the more thickly populated municipalities. The course of study for the rural schools consists of six years' work, the first year in Spanish and the remainder in English. The schools in the sixty-six towns and cities of the island, as well as a few schools elsewhere, are carefully graded, and compare favorably with the better school systems of the United States. In three fourths of the towns the instruction covers the eight grades, and the seventh in nearly all of the others. The ninth grade is also maintained in one third of the towns. The town and city schools have good buildings and equipment. Up to 1910 seventy graded school buildings, with a total of 406 schoolrooms, had been erected since the American occupation. In a number of the schools double enrollments and half-day sessions are necessary to accommodate the children who come. The department maintains partial or complete high schools at about twenty places in the island, and the four-year high schools at San Juan, Ponce, and Mayaguez are said to compare favorably with American high schools, and to prepare students for admission to the standard American colleges. The insular legislature provides for a large number of high school scholarships for deserving students.

Night schools are maintained in practically all of the municipalities. Most of the attendants in these are adults. Many of these are being established in the rural regions, for the education of the people. Instruction in domestic science, manual training, drawing, and agriculture have so far made but small headway, but the beginnings of such instruction have been made. Playgrounds were established first at Ponce in 1908–1909, and a number of towns have since provided playgrounds and playground equipment. Savings banks have been organized in many schools, and have developed much interest, many pupils withdrawing from the school savings banks to start deposits of their own in the regular banks. School libraries were begun in 1908–1909, and within a year and a half 233 libraries had been organized, and only six municipalities were then unrepresented. All now have libraries, and the number is rapidly increasing. Textbooks have been standardized throughout the island, and are furnished free.

The school system is being extended gradually so as to provide for all of the children on the island. The course of instruction is being lengthened in the schools, and more and more children are being enrolled. In 1907 the total enrollment was 54,985, in 1909 it was 87,236, and by 1911 it was 145,525. The number is still somewhat small.

Higher Education. — The University of Porto Rico was established by the insular legislature in 1903. It consists of the insular normal school, at Rio Piedras (first organized in 1899), the college of agriculture, at Mayaguez (1903), and the recently organized (1910) college of liberal arts, at Rio Piedras. The normal school requires the completion of the ninth grade for admission, the college of agriculture the eighth grade, while the college of liberal arts is to be organized on the basis of the same entrance requirements as laid down by the College Entrance Board (*q.v.*) of the United States. For some time the insular legislature has appropriated sums to provide scholarships for study in the colleges and universities of the United States, but the number has been materially reduced in recent years, and they may soon be abandoned. Since 1911 municipalities have been permitted to provide from one to two scholarships, of $350 each, for the study of agriculture or engineering in American colleges.

The University of Porto Rico receives an annual appropriation for maintenance from the insular legislature; the proceeds of certain fines, escheats, and franchise royalties; the income from a permanent endowment fund, created from 25 per cent of the proceeds of the sales of public land; and the annual appropriations made by the United States to agricultural and mechanical colleges for experimental stations and instruction in agriculture. It has a large income, considering its present needs and the amount spent for all other forms of education. E. P. C.

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PORTO RICO, UNIVERSITY OF. — See Porto Rico, Island of.

PORTUGAL, EDUCATION IN. — Portugal cherishes traditions of culture extending back to the period of Roman domination in the Iberian peninsula, but this period and that of the subsequent invasions of the Visigoths and Suevi, and of the Arabian incursions, do not in reality belong to the national history, since the existence of Portugal as an independent kingdom dates from the close of the eleventh century. In 1094 Alfonso VI, son of Ferdinand the Great, conferred the country of Portugal upon Count Henry of Burgundy; the title King of Portugal was first borne by Alfonso Henriques, son of Count Henry, famous for his heroic contests against the Mohammedans. His son Dom Sancho I, who succeeded him in 1185, was forced to continue this contest, but his talents as an administrator were shown by the encouragement he gave to agriculture and to the growth and trade of towns. Both to cities and to noblemen he granted large tracts of land on condition that they should be occupied and cultivated. By this measure he laid the foundation of Portugal's subsequent prosperity. The period of war and territorial expansion continued through the three succeeding reigns, and it was reserved for Dom Diniz, who came to the throne in 1279, to resume the interrupted work of the internal development of the kingdom. He founded agricultural schools, encouraged improved methods of farming and the cultivation of forests, stimulated commerce, especially by a commercial treaty with England, created the royal navy, made his court the literary center of the nation, and founded a university at Lisbon, which was subsequently removed to Coimbra (*q.v.*). All these conditions combined — commercial expansion, the enterprise of free cities, the thirst for glory — went in the end to the making of Portugal's heroic period, which culminated in the sixteenth century with the discoveries of Vasco Da Gama, Amerigo Vespucci, and Albuquerque; in the trade with the " Gold Coast " and with India; in the settlement of Brazil; and in a national school of poetry, of which Camoens was the master spirit.

In the schools which produced these men of varied talents the classics were taught and the known sciences, geography and astronomy; but the schools were few and ignorance prevailed, as may be inferred from the satires of the national poets, who spared neither judges nor prelates in their revelations.

In the middle ages popular education was generally neglected in Portugal. Fragmentary records of elementary schools existing in the fifteenth century are still extant; chief among these a municipal school which was maintained at Evora as early as 1456. The master, a bachelor of arts, taught the elements of Latin to all who desired to learn. In the sixteenth century the number of schools and teachers increased. According to well-authorized accounts there were at Lisbon, in 1551, thirty-four masters of reading and writing, besides seven who taught the Latin grammar, and two women teachers for the instruction of girls.

King John III, whose reign marked the decline of Portugal's power, showed interest for a time in the education of the higher classes. By his direction the university was removed to Coimbra and reorganized, and a college of arts was established to prepare students for the higher curriculum. Subsequently the spirit of intolerance possessed the king. In 1547 he introduced the Inquisition and, shortly after, invited the recently created order of the Jesuits into his realm, gave them direction of the college of arts, and in the end complete monopoly of all education, public and private. The Jesuits confined their attention to the sons of the higher classes, and no general effort was made in the interest of popular education before the eighteenth century. One of the greatest statesmen of this age was the Marquis of Pombal, who practically directed public affairs in Portugal during the reign of King Joseph, which began in 1750. In his measures of reform, the Marquis of Pombal included a system of education which was put into operation in 1772. This system provided for the establishment of a school in every district, regular inspection by government officials, examinations of candidates for teachers' positions, and the appropriation of a special fund for educational purposes. Within a year from the formal adoption of the system, 440 schools were opened on the mainland of Portugal, fifteen in the islands, and twenty-four in the colonies. The next year the number was increased by fifty-seven. The death of King Joseph (1777) deprived his great minister of authority and the fears excited by the French Revolution and the later conflicts, which disturbed all Europe, prevented further progress in education for more than half a century. A slight renewal of the interest in 1820 and again in 1835 showed that Portugal was affected by the democratic movement of the time, and in 1844 an education code was enacted by the legislature which marks the beginning of the present system of popular education. This code, which remained in force till 1881, required parents to secure the education of their children, under penalties for neglect; provided for a central educational council with delegates in every district; and recognized two grades of popular instruction. Later, normal schools were founded at Lisbon and a department of education was created under the charge of the Minister of the Interior.

Present System. — The education law of 1881, prepared by Antonio Rodrigues Sampaio, transferred the control of public instruction from the central government to the municipal authorities and local school boards, and a period of great activity in the establishment of schools followed. In 1890 the central government resumed the control of public schools, creating at that time an independent Minister of Education. Two years later (1892) this office was abolished, and the Minister of Interior became the responsible head of public instruction; centralized control has been continued to the present time. The Minister is assisted by a supreme council; there are no permanent school inspectors, but special inspections are ordered as occasion seems to require. The financial burden of primary instruction is borne chiefly by the municipal authorities; but they are simply the agents of the government in respect to the establishment and equipment of schools. The supervision of schools is intrusted to district superintendents. The government prescribes the subjects of the primary school course and the textbooks to be used in all schools, public and private. Every five years a competition for the best set of books is ordered, the decision being made by a jury composed of professors and teachers.

Primary Schools. — The law requires that every parish shall have one public school for each sex, unless the population is so small or scattered that one mixed school is sufficient. In thickly populated districts, requiring more than one school for each sex, central schools may be established, consisting of four graduated classes with a master for each class. Where the population is too scattered for a permanent school, peripatetic classes are authorized for instruction in the elements and religious doctrine.

The primary instruction law of 1897 recognizes two classes of primary schools, elementary and higher. The latter are limited to towns and villages having 4000 or more inhabitants; in fact, they have been established only in connection with normal schools. The elementary school is divided into two grades: the first of these comprises three classes which cover the period of compulsory school attendance, *i.e.* six to twelve years of age, unless a certificate of exemption is secured before the upper age limit is reached; the second grade consists of one class, and only children who complete this grade are admitted to secondary and technical schools.

The subjects of primary instruction are shown in the following time-table pertaining to the third and fourth classes.

SUBJECTS	NUMBER OF LESSONS A WEEK			
	3d class		4th class	
	Boys	*Girls*	*Boys*	*Girls*
Reading	4	3	3	2
Writing	2	2	1	1
Arithmetic	5	3	3	3
Moral and religious teaching	1	1	1	1
Dictation	3	3	3	3
Drawing	2	1	2	1
Manual work		5		4
Grammar	3	2	3	2
Geometry			1	1
History			2	2
Geography			2	2
Total	20	20	21	22
Total hours	20¼	20¼	20¾	20¾

The subjects given above are greatly extended in the higher primary or complementary schools, and singing, gymnastics, and natural science are added.

Schools must be regularly inspected by a physician, and children cannot be admitted unless they present a certificate of vaccination. A child is excluded if any member of the family is suffering from a contagious disease.

Candidates for teachers' positions must hold the certificate of a normal school, or a departmental training school, or a secondary school. The appointments are made by the minister, at first for a probationary period of three years. When this term is successfully completed the appointment is made permanent.

For the training of teachers there are four state normal schools, one for each sex at Lisbon and at Oporto; at the chief town of each department there is a preparatory school with a special class for training teachers. The expenses of the normal schools and a part of the cost of the departmental training classes are borne by the central government, the municipalities providing the buildings and fittings for the classes. The four normal schools control 180 scholarships for poor and deserving students, which are awarded upon the results of a competitive examination.

The law of 1834 accorded the title of professor to the principals of primary schools. The salaries consist of two parts: (1) a fixed sum according to the class of the teacher, which is continued in case of necessary absence from duty; (2) a sum which is allowed only for active service. The annual salaries for the different classes of teachers as determined by the law of Dec. 24, 1901, are as follows: 3d class, $150; 2d class, $180; 1st class, $220.

The annual salaries of teachers of the higher elementary schools range from $220 to $340. Assistant teachers receive $85 as their class salary and an additional $33 for service. At Lisbon and Oporto teachers are furnished free residence, or a money equivalent for the same.

Maternal schools for children three to six years of age are recognized as part of the system of public instruction, and, also, in localities where the population demands, evening continuation classes for men and for boys above twelve years of age.

Schools under private management, most of which are maintained by religious orders, are restricted only by the obligation to use the textbooks officially sanctioned. "Dominical" schools hold classes for women on Sundays and Saints' days, which afford very complete continuation courses. The *Real Sasa Pia*, an orphanage at Lisbon, is a model institution. It maintains the full course of primary instruction, courses in foreign languages, and a well-equipped industrial workshop. Among the associations of workmen which maintain primary schools, the most important are the *Voz de Operario* and the *Gremio Popular*.

While popular education has been accepted as a responsibility of the state for more than a century, progress in its actual development has been slow and uncertain as indicated by the high degree of illiteracy; in 1900, 78 per cent of the people above six years were in the illiterate class. The latest official statistics of school attendance, which pertain to the year 1900, show an enrollment in public primary schools of 177,540 pupils; in private primary schools, 49,685; or a total enrollment of 227,225, equivalent to 5 per cent of the population. The political disturbances that have taken place during the past decade make it improbable that there has been any decided increase in school attendance. Hence it may be inferred that above 70 per cent of the children of school age are not under instruction.

Secondary Education. — Secondary education in Portugal as in other countries of Europe is preparatory to university studies, but it has not the social exclusiveness that prevails generally on the Continent; pupils may pass directly from the higher primary schools to the secondary, and although the latter are not free schools, the fees are small. The present organization of the secondary department dates from a law of 1894. In accordance with its provisions, Portugal is divided into three administrative or academic areas, the centers of which are, respectively, Lisbon, Coimbra, and Oporto. A secondary school, *lyceum*, is maintained in the chief towns of every department. These schools are of two orders, central schools at the administrative towns, and national schools. The former are organized in seven classes; the latter have only five classes, and pupils pass from them to a central school for the last two years of the course. There are at present thirty state lyceums and one municipal secondary school, with a total registration in 1910 of 8069 students; there is also one public lyceum for girls at Lisbon, which in the same year had 550 students.

There are also private secondary schools which must be open to government inspection and use the official textbooks. They prepare students for the government examination just as the public lyceums do.

The subjects included in the program and their relative importance are indicated by the following tabulation, which shows the weekly distribution of lesson periods for the fifth and seventh classes of a typical secondary school.

Subjects	Lesson Periods Classes	
	V	VII
Portuguese language and literature	4	4
Latin	4	4
French	3	0
English	4	0
German	0	4
Geography	1	1
History	2	3
Mathematics	4	4
Natural and physical science	4	5
Philosophy	0	2
Drawing	2	0
Total	28	26

The executive head of a lyceum is the rector, who is appointed by the government from the professors of secondary education. He directs all the internal affairs of the institution and reports directly to the minister. The professors are appointed by the government upon the results of a competitive examination. The candidate must have the diploma of a secondary school or of a university. The appointments are for life unless forfeited by inefficiency or improper conduct. In case of his removal the professor may appeal to the superior council. The annual salaries in the central lyceums are for rectors, $500; for professors, $600; in the national schools, $400 and $500, respectively.

Higher Education. — Provision for higher education is made by special schools and the University of Coimbra. The former comprise three schools of medicine, three of pharmacy, and a college of letters at Lisbon. Since the Republic was declared, the government has decreed the establishment of three additional universities, which, however, have not yet been organized. The University of Coimbra comprises four faculties (theology having recently been abolished) and in 1910–1911 registered 1352 students. A faculty of letters (*Curso superior de Lettres*) was established in Lisbon in 1858 and was reorganized in 1901. In 1910 this was combined with the Escola Polytechnica (*f.* 1837) and the Escola Medico-Ciurgia (*f.* 1556) into the University of Lisbon with faculties of arts, science, and medicine, and a school of pharmacy. It has a valuable library and laboratory equipments and receives an annual appropriation from the legislature which for 1911–1912 amounted to $170,507.

Technical Education. — The educational reform inaugurated by the Marquis of Pombal included provision for technical education, and the interest has never since entirely declined. The department is in charge of the Minister of Public Works assisted by a special council. The principal technical institution in the country is the Industrial and Commercial Institute of Lisbon; there are also a number of local industrial and commercial schools well sustained and equipped for the specialties to which they pertain. The important school of art at Lisbon receives a governmental grant amounting to $15,800 annually; a school of art at Oporto is also subsidized.

In accordance with a financial law of 1907, there is an annual appropriation equivalent to $100,000 for scholarships which are awarded to professors and students appointed to pursue studies and researches in the chief centers of technical education in Europe. By this means the government seeks to correct the excessive regard for literary and speculative studies characteristic of the educated classes in the kingdom.

Recent Movements. — In October, 1910, Portugal was declared a Republic; as a consequence of the revolutionary condition which attended this change, progress in education halted. By the separation of Church and State and the expulsion of the Jesuits under the new government, the chief agencies of education have been either crippled or destroyed; hence it may be said that education has now to be reorganized in the Republic. The work has already begun in the university which has been the subject of several orders directed mainly to the improvement of the medical course. The requirements for admission to that faculty, especially in the chemical and biological sciences, have been increased and the laboratory facilities extended. The expenditure for public education in 1910 was 3,742,569 milreis ($4,041,974), not including 486,896 milreis granted to the ministries of war and marine for the technical schools pertaining to their services. A. T. S.

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POSEN ROYAL ACADEMY, POSEN, PRUSSIA. — Established in 1903 to promote German intellectual life in the province of Posen and West Prussia through the media of teaching and scientific research. Two years earlier the efforts to raise the intellectual life of the provinces had resulted in the formation of a German Society for Art and Sciences, which coöperates with the Academy by arranging for public lectures delivered by instructors of the Academy in all sections of the province. Until 1910 the courses of the Academy were given in various city institutions, but in January of that year a splendid group of buildings was completed for the Academy. It began its activity with thirteen professors, four docents, and twelve lecturers, and there have been no important numerical changes in the teaching staff since then. The rector is chosen for a term of three years, the first incumbent having been Professor Eugen Kühnemann, former exchange professor at Harvard and the first incumbent of the Carl Schurz chair at the University of Wisconsin (1912–1913). Theology is not represented in the curriculum of the Academy, and the study of medicine is confined largely to hygiene and physiology (in connection with the Hygienic Institute). Both public and private law are represented, but the chief emphasis is placed upon the subjects usually comprised in the German faculty of philosophy, including political science and pure science, although only a few disciplines of the last-mentioned group are provided for. A limited amount of university credit is allowed on certain subjects, the expansion of the Academy into a full-fledged university having been proposed several times. Extension courses (*Fortbildungskurse*) are also offered by the Academy. The budget amounts to about $35,000 annually, and there are approximately 1000 students in attendance during the winter semester, of whom about 30 per cent are women. Aside from a number of departmental libraries, the Academy is dependent upon the Kaiser Wilhelm Library of the province, which contains over 200,000 volumes, as well as a traveling library of over 20,000 volumes intended for circulation in the entire province. The city of Posen also contains a Royal Hygienic Institute, founded in 1899; the Kaiser Friederich Museum, founded in 1894; and the Royal State Archives. R. T., Jr.

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POSITION OF CHILDREN IN SCHOOLROOM. — See School Management; also Desks and Seating.

POSITIVE NUMBERS. — See Negative Numbers.

POSITIVISM. — A philosophic term derived from the French term *positif*, whose connotation is quite different from that of the corresponding English adjectives. In its most general sense positivism means a philosophic theory which does not recognize any facts or principles save those known and verified by the methods of the mathematical and physical sciences. A strict positivistic philosophy thus confines its assertions to the relations of coexistence and sequence that are ascertained to exist among natural events, and is agnostic as to any realities, whether conceived as substances or forces, which lie behind or beyond these natural events and their spatial and temporal relations. Positivism is used more specifically to denote the philosophy of August Comte (*q.v.*), who combined a philosophy of history and society, and a social and religious ideal with a scientific agnosticism.

According to his view of history, mankind passes through three stages of intellectual development, these stages controlling the accompanying phases of life. The first is the theological, in which events are explained on an animistic basis in the broad sense of that term. Events are explained by reference to personal volitions and emotions of non-human beings. In the second, or metaphysical, stage forces are substituted for these personal beings, monotheism being the transition point. The metaphysical stage culminates in the idea of Nature as the ultimate and unifying force. Then comes the positivistic stage, when men content themselves with trying to ascertain accurately the facts and events of the space and time world as that shows itself to sense perception. The intellectual development is paralleled by a social-religious development. The theological stage, although most inadequate intellectually, was highly favorable to social organization because of the emphasis it put upon powers akin to those of man. The metaphysical stage, with its emphasis upon impersonal abstract forces, was unfavorable to the nurture of intimate social relations. The association of individualism in the eighteenth century with the conception of Nature as the ultimate norm represented the logical outcome of the metaphysical stage. The problem of the present or scientific era is to combine the religious and social spirit of the theological age with the objective, impersonal, intellectual attitude ushered in by the metaphysical stage. The method of effecting this combination constitutes the constructive portion of Comte's Positivism.

Since we can know only the spatial and temporal associations of phenomena, we must surrender all hopes of any objective or ontological synthesis. Some kind of synthesis, however, is necessary in order to give mankind that unity of outlook, belief, and aim which is requisite for its own unified organization, and is necessary to supply the motive force of social devotion which religion supplied in the past. The solution is to make a "subjective synthesis," an organization of scientific knowledge from the standpoint of its bearing upon social life and in the interest of the unification of that life. This amounts practically to substituting "Humanity" for Divine Beings and for Natural Forces as the ultimate standard of value and center of reference, recognizing, however, that Humanity is not an ontological reality, but an ideal, whose existence is capable of becoming more and more of a fact in the course of human history. To make Humanity an object of religious devotion and to construct a religion of humanity, modeled on the whole upon medieval Catholicism, were more or less logical consequences of this conception.

While Comte succeeded in organizing a church, with branches still maintained in France and England, to represent his ideas and inaugurate his new religious scheme, his chief influence has been in general conceptions which have deeply affected the thinking of those who would not term themselves Comtians or even Positivists. That natural science does not itself tend to the promotion of social organization and welfare; that scientific specialization by itself is likely to be disintegrative; that modern life is sorely in need of a method such as was supplied by the religions of the past for bringing knowledge into connection with practice and conduct; that the ultimate purpose of science must be prediction of the future and social control,— are ideas that Comte developed with great power and that have become deeply engrained in contemporary culture. J. D.

See Comte, August.

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POSTGRADUATE. — A term in common use in the United States to indicate university as distinguished from college students; that is, a postgraduate is the student who has taken the baccalaureate degree. The use of the term is due to the fact that American universities have, in most instances, grown out of undergraduate colleges and that the two institutions yet exist in almost every instance under the same management.

See Universities, American.

POSTULATE. — See Axiom.

POSTURE. — See Desks and Seats; Physical Education; Reading, Hygiene of; Spinal Curvature; Writing.

POTTER, ALONZO (1800–1865). — American bishop and educational writer; graduated from Union College in 1818. He was a tutor and professor at Union College for six years and then engaged in the work of the ministry. In 1832 he returned to Union College as professor of moral and intellectual philosophy, and as vice-president of the college. He resigned his position in 1845 to become Bishop of Pennsylvania. His educational writings include *Political Economy* (1840), *Principles of Science applied to Domestic and Mechanic Arts and to Manufacture* (1841), joint author with George B. Emerson (*q.v.*) of a popular teachers' book entitled *The School and Schoolmaster* (1842), and *Handbook for Readers* (1843). W. S. M.

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POTTER, ELISHA REYNOLDS (1811–1882). — State Superintendent of Schools; was educated at the Kingston (R.I.) Academy and Harvard College, graduating at the latter institution, 1830. He was active in the organization of the Rhode Island public school system and was one of the founders of the Rhode Island Institute of Instruction (*q.v.*). He was commissioner of education in Rhode Island from 1849 to 1854. He was the author of numerous papers on education printed in the proceedings of the Rhode Island Institute of Instruction and in the *Rhode Island Schoolmaster*, and *Bible and Prayer in the Public Schools* (1854). W. S. M.

See Rhode Island, State of.

POTTERY WORK IN THE SCHOOLS. — **Education in Clay and Ceramics.** — The unique property of plasticity as possessed by moist clay appeals strongly to the pupils. Even in elementary work the reality of expression rendered possible by solid form affords a satisfaction which is lacking in a mere outline. The pupil is enabled to think in three dimensions and actually to produce the object conceived. Imitative modeling is not necessary as an introduction; the work may be creative from the beginning. The child may be taught to produce common articles of which the use is well understood. The simple cylindrical form of a drinking mug affords a good exercise in manipulation, and the control of the material is learned. In the early work tools are unnecessary, or may be of the very simplest character. In the higher grades there is no difficulty in planning progressive exercises. At first the forms are made more complex. Candlesticks, small jugs, bowls, trays, and tiles readily suggest themselves. Then simple decorations are applied by an incised line or groove. This is followed by an embossed design produced by depressing the background, and eventually use may be made of raised lines applied by laying on liquid clay with a brush, and in all there is a possibility of added color either in the clay itself or as a pigment. The recent developments in portable kilns with kerosene fuel make it possible actually to burn the pottery in the school and to add an appropriate glaze. This renders the pottery permanent and useful.

In several states provision has been made for education in practical clay working upon a large scale. The ceramic industries include not only pottery, but brick, tile, terra cotta, sewer pipe, fireproofing, insulators, glass, cement, and enamels for steel and iron. Education in these several fields embraces a comprehensive study of chemistry, physics, geology, and the general engineering subjects, besides the special technology of clays, glasses, and glazes, and the reactions which take place at high temperatures. Students entering the ceramic schools are expected to be prepared for college, and the work throughout is pursued upon a collegiate basis.

Germany was the pioneer in ceramic research and training, the first important work having been done by Herr Professor Hermann Seger, who in 1869 decided to devote himself to the study of ceramics. Prior to this the manufacturer of clay wares had to depend upon empirical knowledge. There are now two important ceramic schools, one at Bunzlau, under Dr. Wilhelm Pukall, the other at Höhr, under Dr. E. Berdel. In America the beginning was made by Professor Edward Orton, Jr., who in 1893 began an agitation for the establishment of special training in ceramic science, with the result that in 1894 the first American ceramic school was opened at the Ohio State University. Other schools and departments of ceramics have been established at Alfred University, Alfred, N.Y.; Rutgers College, New Brunswick, N.J.; Illinois State University, Champaign, Ill.; Ames College, Ia.; the University of North Dakota; and Tulane University, New Orleans, La. Ceramic instruction as applied to school work and the individual production of pottery is given at the Mechanics Institute, Rochester, N.Y.; Teachers College, Columbia University, New York City; the Technical High School, Cleveland, Ohio; University City, St. Louis, Mo.; the Bradley Polytechnic Institute, Peoria, Ill.; the School of Education, University of Chicago, Ill.; the School of Industrial Art, Philadelphia; the Maryland Institute, Baltimore, Md.; the Handicraft Guild, Minneapolis, Minn.; the School of Industrial Arts, Trenton, N.J. The American Ceramic Society was founded in 1899.

In England an attempt was made as early as 1887 by the City and Guild of London Institute by offering annual examinations in the technology of pottery making. This movement has since developed into the establishment of a pottery laboratory in the heart of the Staffordshire Potteries under the charge of Dr. J. W. Mellor. The English Ceramic Society was founded in 1901. C. F. B.

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POUNDS, JOHN (1766–1839). — A cobbler of Portsmouth, England, who originated the system of ragged schools. Crippled for life by an accident in 1781, he took up the trade of a shoemaker. In 1818 he was given charge of a nephew, aged five, and to find companions for him he invited other children. Stimulated by his love for children and a natural teaching ability, he undertook their education and increased their number to thirty or forty at a time, choosing the poorest and the outcast from the streets of Portsmouth. He taught reading, sometimes from handbills, and arithmetic, and instructed his pupils in cooking, mending shoes, and making their toys. His life generally was signalized by broad humanity and sympathy, which he found many opportunities of manifesting practically. By 1839, the year of his death, he had taught about 500 pupils. Many ragged schools (*q.v.*) were established in England and Scotland, influenced by the example of John Pounds.

See Carpenter, Mary; Guthrie, Thomas; Reform Schools, section on Industrial Schools of England.

POVERTY SCHOOLS. — See Ragged Schools.

POWELL, WILLIAM BRAMWELL (1836–1904). — City superintendent of schools; was educated in the public schools of Illinois, at Wheaton Academy, and at Lombard University. He was for two years principal of the schools at Hennepin, Ill.; eight years superintendent of the schools at Peru, Ill.; sixteen years superintendent of schools at Aurora, Ill.; and fifteen years superintendent of the schools at Washington, D.C. His publications include *How to See* (1880), *How to Talk* (1880), *How to Write* (1880), *History of the United States for Beginners* (1890), a series of school readers, and numerous articles in educational journals and the proceedings of educational associations. W. S. M.

POWER. — In current arithmetics there is often a chapter on powers and roots, the power of a number meaning the result of taking the number a certain number of times as a factor. This is the primitive use of the term, and is found in the Greek as δύναμις, from which we have such words as dynamite, dynamo, and dynamic. The Greeks used the word, however, to mean the second power, or square. Diophantus (*q.v.*) used it to mean the second power of the unknown quantity, or, as we would write it, x^2. For higher powers Diophantus used κύβος, δυναμοδύναμις, δυναμόκυβος, and so on. The early Italian algebraists used *podestà* for the second power, and also *censo*, with other special names, for higher powers. In the seventeenth century the fractional exponent already suggested by Oresme (*q.v.*) and the negative exponent came into general use. This led to the broadening of the concept of power to include other than integral powers. The primitive definition now ceases to hold, and, with a broadening of the definition, it becomes proper to speak of fractional, negative, complex, or transcendental powers. In modern education this broader use of the term is coming to be generally recognized, and sanction is being given to such expressions as "a to the one-half power," "a to the minus third power," and so on. D. E. S.

POWIS, LORD. — See Parliamentary Commissions.

PRACTICE. — See Formal Discipline; Habit; School Management.

PRACTICE CURVE. — A curve representing the result of practice in which the height of the various points in the curve above a base line represents the amount of performance and the horizontal distances from the beginnings of the curve represent the number of repetitions of the activity. Repetition of a mental performance is attended by more or less improvement in the capacity for performance. Practice curves have been obtained in the performance of acts requiring different degrees of mental attention. Thus Figure 1 represents a practice curve characteristic of the "trial and error" method in the case of the successive attempts of a cat to escape from a cage by turning a button on the door of the cage. Figure 2 represents a human practice curve in learning by the trial and error method, where the subject traced the diagram shown in the upper right-hand corner of the figure, the diagram and the hand being seen only in a mirror. The lowering of the curves indicates improvement. The upper curve shows the effect of practice in shortening the time taken

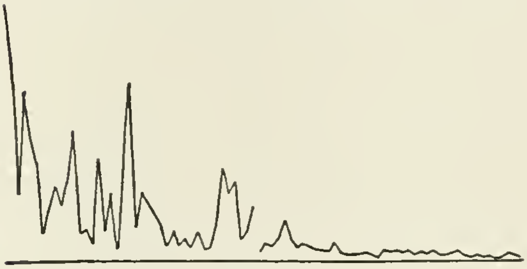

Fig. 1.

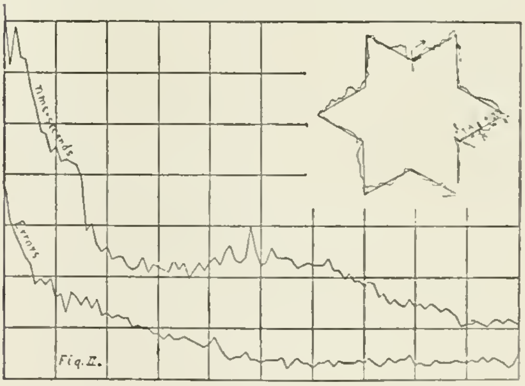

Fig. 2.

to trace the drawings; the lower represents the progress of the learning process in terms of the number of errors made. The curves also show periods in which practically no progress takes place (plateau periods), which must be taken as representative of points at which assimilation is taking place, since they are followed by periods of rapid progress. This feature is even more strikingly shown by the curves of Figure 3, showing the progress made in the learning of telegraphy. The upper curve represents the improvement in sending messages, rapid at first and then gradually lessening, until the limit of the effect of practice is reached. The lower curve represents improvement in the ability to receive messages, which follows an entirely different course from that of sending. The two lower curves in Figure 4 show the progress of the formation of habits of a relatively low order; namely, receiving separate letters and words. Both these activities improved rapidly for a time,

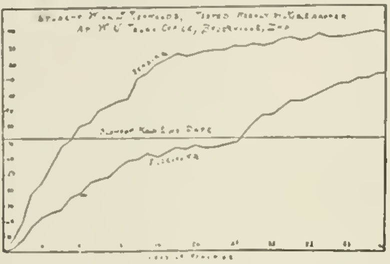

FIG. 3.

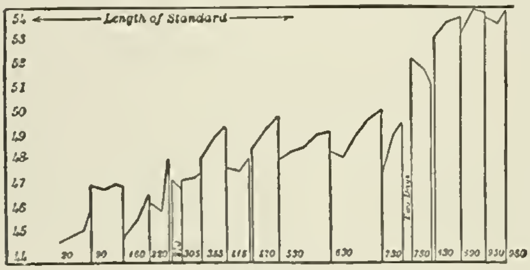

FIG. 4.

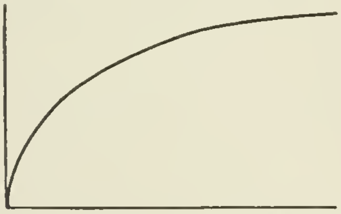

FIG. 5. — A typical curve of learning. The curve is not typical in one respect, since it does not show the fluctuations of efficiency which always appears; but is intended to show the general increase (rise) of efficiency with continued repetition of the performance. Horizontal distances denote the time spent in learning, and vertical distances the measure of efficiency.

finally reaching a maximum in a similar fashion to the relatively simple process of sending. The effect of practice upon the memorizing of a series of nonsense syllables is represented in Figure 5, where the progress is very rapid at first, then more gradual, finally reaching a point at which perfection is possible. E. H. C.

See HABIT; GRAPHIC CURVE; STATISTICAL METHOD.

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PRACTICE LESSONS. — See TEACHERS, TRAINING OF.

PRACTICE SCHOOL. — A school of elementary or secondary grade maintained as a laboratory in connection with a normal school or teachers' college for the purpose of providing students of education or apprentices in teaching with opportunity for schoolroom management and teaching. Frequently the same laboratory school serves the purposes of a demonstration (observation or model) and an experimental school. Such a school may be specially organized for its particular purpose, or may be a school in the regular school system assigned to this function. H. S.

See DEMONSTRATION SCHOOL; EXPERIMENTAL SCHOOLS; MODEL SCHOOL; OBSERVATION SCHOOL; TEACHERS, TRAINING OF.

PRACTICE TEACHING. — See TEACHERS, TRAINING OF.

PRACTICE, TRANSFER OF. — See FORMAL DISCIPLINE; PLATEAU; HABIT.

PRACTICE WORK. — See TEACHERS, TRAINING OF.

PRAGMATISM. — The conception (though not the word) pragmatism was first proposed by the American mathematician and logician, C. S. Pierce, in an article published in 1879 in the *Popular Scientific Monthly*, upon "How to Make Our Ideas Clear." The gist of the notion is that the *meaning* of any idea or conception lies in the consequences that flow from an existence having the meaning in question, so that the way to get a clear conception is to consider the differences that would be made if the idea were true or valid. In conversation Mr. Pierce used the term "pragmatism" to designate this view of the nature of conceptual meanings. Some twenty years afterwards William James proposed the use of this idea as test of the meaning and worth of specifically philosophic conceptions. He argued that the point of any philosophic doctrine or issue lies in the particular differences that would follow if the idea in question were true, and that if no differences can be made out, the doctrine or issue is wholly verbal. This theory is strictly a method for determining the meaning of concepts; it is not a theory of their truth nor of their relation to existence. Pragmatism in this narrower sense, Mr. Pierce has since wished to call Pragmaticism, to differentiate it from a later extension which Mr. James and others gave the doctrine.

In his *Psychology* and his *Will to Believe,* James had pointed out the influence of interest, choice, and emotional factors upon our beliefs and had made a plea for the recognition of the validity of these factors under certain circumstances. Schiller of Oxford devoted himself to a reform of logic in the direction of greater concreteness and usefulness through recognition of the part played in thinking by emotional and volitional factors, and generalized the underlying idea into the theory that all knowledge is purposive or teleological. This view James adopted as part of the pragmatic conception. Since interest, choice, and effort are involved in knowledge, knowledge is essentially experimental and in constant process of making. Since, by common consent, truth is the goal in which knowledge proper terminates, it follows that truth is not something antecedent to our intelligent activities, but something following upon them and produced by them. Since truth involves the relation of *objects* to thought, this making of truth logically implies a making of reality. So, by a natural extension, pragmatism was widened from a theory of the purposive character of knowledge and a theory of truth as the successful working out of knowledge, to the theory that reality itself is plastic and is in course of construction through the cognitive efforts of man. This aspect of pragmatism, Schiller called Humanism.

In his *Psychology,* James had suggested, and to some extent used, the idea that intelligence, or man's knowing power, evolved as an instrument of adaptive response to stimuli, lying between sensory stimuli and motor response. Dewey and others took up this suggestion, and developed on the psychological side the idea that thinking or reflective attention is the counterpart and complement of habit. Habit expresses the mode of response to old and well-established stimuli; thinking to stimuli where novelty and a doubtful or precarious factor are marked features. This conception was also more or less systematically applied to a reconstruction of traditional logical theory. Logic was treated as a systematized account of the procedures of thinking in adapting beings living in a social environment to the control of novel and uncertain features of existence, these features being treated as possessed of objective character. On the moral side, the notion was extended to the theory that standards and ideals are not fixed and *a priori*, but are in a constant process of hypothetical construction and of testing through application to the control of particular situations. This general logical and ethical view, known specifically as instrumentalism, was also adopted by James as a part of pragmatism in its wider sense.

It is generally admitted that pragmatism, while still in a formative state, has exercised an influence as a philosophic ferment out of proportion to the number who have definitively accepted it. It falls in line with the growing influence of the theory of evolution, asserting that reality itself is inherently and not merely accidentally and externally in process of continuous transition and transformation, and it connects the theory of knowledge and of logic with this basic fact. It connects with historic spiritual philosophies in its emphasis upon life, and upon biological and dynamic conceptions as more fundamental than purely physical and mathematical ideas. While claiming to be strictly empirical in method, it gives to thought and thought relations (universals) a primary and constructive function which sensational empiricism denied them, and thus claims to have included and explained the factor that historic rationalisms have stood for. In somewhat similar fashion, it claims to mediate between realistic and idealistic theories of knowledge. It holds to reality, prior to cognitive operations and not constructed by these operations, to which knowing, in order to be successful, must adapt itself. In so far, it is realistic in tendency, and pragmatism is usually recognized to have been an influential factor in calling out the reaction against the Kantian and Neo-Kantian idealisms dominant upon its first appearance. But it does not hold that the adaptation of intelligence to existence is a matter of literal conformity or sheer reproduction by way of copying, but rather that it is an adaptation in the interest of a further evolution of life in complexity and richness of meaning. Hence it claims to recognize and include the verifiable facts as to the rôle of thought in the world which have given rise to the idealistic exaggeration. Although the issue as to the future of pragmatism is still pending, the present writer may be pardoned for calling attention to its advantages as a working hypothesis in educational theory. In its conception of knowledge as a present living process (not a collection of static results) and its conception of knowledge as having a concrete purpose to fulfill in situations of practical experience (not something existing complete in itself in a purely theoretical region) it adopts and tries to justify the position which any one must of necessity assume in his endeavor to develop intelligence and make knowledge a vital factor in character and conduct. J. D.

See also Experience; Empiricism; Induction and Deduction; Knowledge; Logic; etc.; also Education, and the references there given.

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PRAGUE, CHARLES-FERDINAND UNIVERSITY OF.—The oldest institution of higher learning within the confines of the old Holy Roman Empire of the German nation. It was established in 1348 by Emperor Charles IV and received the papal sanction from Clement VI. Prior to this time Germans in search of a university education had been compelled to go to France or Italy, and they were destined soon to encounter difficulties in their own institution. The strong German influence that had made itself felt in Bohemia in the first half of the fourteenth century was followed by a Czech reaction, which culminated in a decree of Jan. 18, 1409, in accordance with which the administrative control passed from German into Czech hands: the Bohemians were in future to be given three votes, as against the single vote of the other three nations (Bavarians, Saxons, and Poles) combined. This resulted in an exodus of the German students and in the establishment of the University of Leipzig (*q.v.*). Before this defection the university boasted of an enrollment of over 2000 students. It had been established in accordance with the medieval custom as a corporation of four gilds, *i.e.* the traditional four faculties of theology, law, medicine, and liberal arts, the University of Paris serving as a model and the Archbishop of Prague acting as Chancellor. The emigration of the German students was followed by a series of religious conflicts, and as a result of these two factors a period of decline set in. Ferdinand I, therefore, called the Jesuits to Prague and turned over to them the Dominican Monastery of St. Clement, where a Catholic academy with a theological and a philosophical faculty was organized. During the first half of the seventeenth century the Jesuits were driven out of Prague on two separate occasions, but after the Thirty Years' War (in 1653) the Jesuit academy was combined with what remained of the secular institution into a single university, the Karolo-Ferdinandea, by Ferdinand III. Various reforms were introduced during the reigns of the Empress Maria Theresa (*q.v.*) and of Emperor Joseph II, in the second half of the eighteenth century, and German was made the language of instruction. In 1849 a thorough reorganization of the methods of instruction took place, and in 1882 a partition into a German and a Czech university was effected. In 1848 permission had been granted to deliver lectures in the Czech language, and the German party feared that unless a separation were brought about, the Czech element would gain absolute control. There are thus two separate and distinct universities, known officially as the Imperial-Royal German Charles-Ferdinand University, and the Imperial-Royal Czech Charles-Ferdinand University, the German language being the exclusive medium of instruction in the former, and Bohemian in the latter. Each of the two institutions has its own buildings and its own administration, while the library is independent and is used jointly by both universities. The Czech faculties of law and philosophy were organized in 1882, that of medicine in the following year, and that of theology in 1891, the latter as well as the theological faculty of the German university being Catholic. During the winter semester of 1910–1911 there were 1557 students in attendance on the German university, of whom more than half were enrolled in the faculty of law; there were also 287 auditors registered. The teaching staff of the German university comprises about 175, that of the Bohemian university over 200 teachers. The latter had 4432 students in attendance in the winter semester of 1910–1911, of whom almost 2000 were enrolled in the faculty of law, over 1500 in philosophy, and 800 in medicine. The annual budget of the German university amounts to about $335,000, that of the Bohemian university to about $385,000. The public and university library, established in 1773, contains 400,000 volumes, 4000 volumes of manuscripts, over 1500 incunabula, 29,000 engravings, 1700 volumes of documents, etc. Both institutions maintain a comprehensive group of medical institutes and clinics.

Prague was the first city in Germany or Austria to establish a technical school, namely in 1806, the institute having been organized on the model of the *Ecole polytechnique* of Paris. For the first nine years students were matriculated through the philosophical faculty of the university, but in 1815 the institution was placed on an independent basis, a complete reorganization having taken place in 1829–1832. The bipartition into a German and a Bohemian school took place in 1868. The former had 1965 students and 225 instructors in the winter semester of 1911–1912, the latter 4414 students and over 249 instructors.

Prague also contains several valuable public and private libraries, as well as several archives and museums, among which special mention must be made of the Bohemian National Museum, founded in 1818, and including a library of 265,000 volumes, 6300 manuscripts, 77,000 engravings and photographs, etc.

R. T., Jr.

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PRATT INSTITUTE, BROOKLYN, N.Y. — An institution established in 1887 by Charles Pratt, to promote industrial education, to inculcate habits of industry and thrift, to foster all that makes for better living. It aims further to conduct its courses in such a way as to emphasize the application of art and science to industry and to give to every student practical skill along some one line of work. It consists of five schools, — fine and applied arts, household science and arts, science and technology, kindergarten training, and library science, — giving twenty-four full-time day courses two years in length, including three courses for the training of teachers. In addition, there are thirty-two complete evening courses, a large number of part-time day courses, and Saturday morning classes. Diplomas are awarded for the satisfactory completion of the normal courses, and certificates for the other full-time courses, but no degrees are conferred. The Institute has also a free public library of 100,000 volumes, a gymnasium, a men's club, and a resthouse for the care of students when ill or indisposed. It occupies in all twelve buildings. It has 150 instructors and an average annual enrollment of 3500 students. It has a permanent endowment fund of $4,850,000, and buildings and grounds valued at $1,600,000. F. B. P.

PRAYER IN SCHOOLS. — See Bible in Schools; Church Attendance of Scholars; Religious Education.

PRECENTOR. — See Song School under Middle Ages, Education in.

PRECEPTORIAL SYSTEM. — See also Tutorial System; Prefect and the Prefectural System; Princeton University.

PRECEPTORS, COLLEGE OF. — An association founded in 1846 and granted the Royal Charter in 1849 "for the purpose of promoting sound learning and of advancing the interests of education, especially among the middle classes, by affording facilities to the teacher for acquiring a knowledge of his profession," etc. The College was also empowered to establish lectureships in education and to do whatever is "calculated to advance the cause of education or the interests of the scholastic profession, particularly in England and Wales." To attain these ends the College instituted examinations for pupils in secondary schools and for teachers. Diplomas and certificates are granted as the result of the examinations. For teachers the examinations are conducted in three grades (associateship, licentiateship, and fellowship) and all include the theory and practice of education. The College was a pioneer in the training of teachers for secondary schools. Indirectly the school examinations, instituted successfully in 1853, served to establish standards and guide teachers; in 1861 an unsuccessful attempt was made to establish a series of lectures in education; in 1867 the first examination in the theory and practice of education was conducted; in 1871 a successful series of lectures on education was introduced; and in 1873 the first professorship in education in England was established by the College. (See Education, Academic Study of.) In 1895 a Day Training College for Secondary Teachers was established, but was discontinued in 1898. In addition to the theoretical written examination, the College also holds practical examinations for certificates of ability to teach. Winter meetings and short courses for teachers are also conducted.

Since 1853 examinations have been conducted for pupils in secondary school subjects. An examination had already been held in 1850. There are three grades of examinations: third class or lower, second or junior, and first class or senior. Certificates and prizes are awarded on the results. In addition to the certificate examinations, the College also conducts an examination for lower forms, but since by a Board of Education regulation pupils under fifteen in grant-earning secondary schools are not allowed to take an external examination, the activity of the College in this direction is limited. Many schools make use of the marks obtained in the College of Preceptors for purposes of promotion, etc. Besides the school examination there is a Professional Preliminary Examination conducted at local centers; the certificate obtained on this examination is recognized by the Board of Education and a large number of professional associations. The College also has power to inspect schools with reference to (*a*) the suitability of the school premises; (*b*) the adequacy of the teaching staff; (*c*) the sufficiency of the apparatus and appliances for teaching; and (*d*) the organization of the school.

Membership in the College of Preceptors is open to all persons over eighteen years of age engaged in education, who have passed an examination satisfactory to the Council, but subject to election by the Council. The College, which is located in Bloomsbury Square, London, possesses a library of 10,000 volumes and a common room and reference library for the use of members. Meetings are held once a month for the reading and discussion of papers on educational topics. The organ of the College is the *Educational Times*, one of the oldest educational journals in England.

See Education, Academic Study of; Educational Associations; Examinations.

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PRECOCITY. — See Prodigy.

PREDISPOSITION. — Inherited tendency or capacity for acting in a certain manner. The term is thus opposed to habit, which is acquired activity. In a broader sense the term is used to include inherited physical tendencies, as well as mental.

Its relation to temperament, *i.e.* sum total of dispositions and predispositions, is a problem resolving itself into that of the relative influence of heredity and environment.

Among the predispositions which have figured largely in the literature of the subject are innate ideas (*q.v.*). The doctrine of innate ideas held that the intellect finds itself at birth in possession of certain primary conceptions. In its more refined form this doctrine holds that the human intellect has certain capacities at birth which impel it, under the influence of expression, to certain conceptions and judgments. See Heredity. E. H. C.

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PREFECT AND THE PREFECTURAL SYSTEM. — Prefects (Winchester, Charterhouse, Marlborough, Bradfield, and the majority of the public schools), præpostors (Eton, Rugby), monitors (Westminster, Harrow, and some other schools), are older boys invested by the headmaster with specific authority over, and power of enforcing their authority by personal chastisement of the younger boys in a school. The prefect or monitorial system of self-government of boys by boys, in the life out of school hours is often put forward as the essence of the Public School (*q.v.*) of England and the peculiar virtue of the English public school system. With inexcusable ignorance of the history of schools, the creation of this system, or at least its vogue, is often attributed to Dr. Arnold (*q.v.*) when Headmaster of Rugby (*q.v.*). A more conspicuous instance of putting the cart before the horse would be difficult to find.

The truth is that the system is of immemorial antiquity, and can be traced not only to the foundation statutes of Winchester College, at the end of the fourteenth century, but is found in the only full series of school statutes which are extant to us before that, — in the new statutes of St. Alban's School made in 1309; while the Winchester statute is a direct repetition of provisions in the statutes of Merton College, the oldest university college at Oxford, made in 1274. In essence the prefect system is connected with the pupil-teacher system, which prevailed at a very early time.

In the earliest curricula of Winchester and Eton which have come down to us (in 1530) the pupil-teacher system appears in full vogue, the Vth form getting its verse rules from the VIth and giving its grammatical rules to the IVth, and so on. At Winchester the system of pupils acting as tutors to juniors and seeing that they did their verse and prose tasks, and helping them to do them, prevailed certainly down to 1850. The task of teaching carried with it the prerogative of correcting, insomuch that it was a matter of solemn discussion in canon law treatises whether, if a son taught his father, the right of correction which the father possessed by the law of nature over the son did not yield to the right of the master to correct the pupil; a right the special grant of which over Heloise by her uncle to her tutor Abelard was a main cause of their tragic love story.

Now in the statutes of Merton College, in which it must be remembered the junior fellows or scholars, as they are called, were boys or little more than boys, while thirteen were to be grammar school boys before being admitted scholars, it was provided by chapter seven 'Of the office of the Dean' that "some of the more discreet of the aforesaid scholars shall be elected to take charge, under the Warden and as his assistants, of the less advanced as to their progress in learning and as to the uprightness of their behavior; so that in every twenty, or, if necessary, ten" — whence the name of tuition tithing-man or dean — "one shall preside. Also in each chamber in which the scholars live there shall be one more mature than the rest who shall superintend his companions, or fellows (*sociis*) and report to the Warden and the rest of the præpostors (*cœteris in hujus modi cura prœpositis*) and to the whole body of scholars themselves, if necessary."

The statutes of St. Alban's School in 1309 appear to show elder scholars already acting as agents and magistrates themselves. These statutes were solemnly made by the master of the school as Ordinary Judge of the school in the presence of a notary public of the Holy Roman Church and Empire, and are given out not as legislative innovations but as writing down established customary law. They are to be made by the master and bachelors, much as at Oxford statutes were made by the Chancellor and masters, or by a mayor and citizens. The usual punishment denounced for offenses was excommunication by the Master, the secular arm being invoked if necessary to sequestrate the offender's goods; or canonical correction, *i.e.* flogging by the master.

The undermaster appears to be called the *hostiarius*, doorkeeper or usher, as he was at Winchester. But there was also an underostiarius (*sic*). The ostiarius or under-ostiarius was always to sit by the door, and never to allow more than two or three scholars to go out of school at the same time. If they did not execute their duty, the master corrected them. If a scholar in the school, or outside, struck another scholar or was guilty of an outbreak (*rabiando delinqueret*) or made a great noise, his hood was to be taken by the hostiarius and he was presented to the vice-monitor and chastised by him. Whether the vice-monitor was a boy or an undermaster is not clear. But there was an order of bachelors in the school, who might either be bachelors in a university or might be created by the master after examination in the school, their ability being tested by composition of Latin verse or prose or a rhyme, and public disputation in grammar. If any one assaulted the master himself, not only was he to be excommunicated but he was "while under excommunication to receive salutary discipline in the school from all the bachelors." Here then the bachelors seem to be prefects, wielding the *baculus* or stick, the "ground-ash" of the Winchester prefects, and "tunding" the offender, or "tanning" as it is called at Westminster. Moreover, the master appointed two of these bachelors to take care of St. Nicholas' chest, in which were deposited the precious and expensive wax candles which burned before the image of St. Nicholas, here as elsewhere the patron saint of schoolboys, and the miter and episcopal staff or crozier used in the celebration of the boy-bishop (*q.v.*)who dressed up as St. Nicholas and performed service on his day, December 6. In it also was kept the Great Priscian, the large grammar in twelve books, which was the standard authority and presumably referred to for settling disputed points. So here we have the prefects exercising administrative powers, as in later times the Prefect of Tub at Winchester superintended the deposit of the broken meats from dinner in the tub standing in the middle of the hall for distribution among the poor; and as late as 1865, and perhaps still, providing for the baize linings of the doors and other necessaries in school.

It is certainly improbable that the prefect system was confined to English schools. We get in Buchanan's proposals (1509) for the College of Humanity or Grammar School at St. Andrews, founded on the model of Strassburg and Geneva academies, references to Decurions, who were to note defaults and especially not speaking Latin, which appears to show that something like the prefect system flourished in foreign schools also. But there have been such violent convulsions of schools abroad that their continuity has not been preserved to the same extent. Moreover, self-government has always been more advanced in England than on the Continent of Europe from the time of Edward I onward, and it is natural that schools should reproduce the system of the state and nation. It is certain that in England the prefect system was ubiquitous and not confined only to the great public schools, though naturally it is from them that the documentary evidence is most ample and the widely proclaimed tradition is most vocal. Such instances as the statutes of Giggleswick School, a relatively small school in Yorkshire, made in June, 1592, and the Hertford Grammar School statutes in 1617, bear evidence that the smaller schools were governed on the same system. Rules in the former provide that "What scoler or scollers who in the absence of the master and usher shall not obey the two prepositors by the master appointed for the order and quyetnes of the said schole shall for every offence proved be subject to the severe censure of the said master or usher." At Hertford "all schollers on the usher's syde shall speake Latin altogether, and for the observinge thereof the master to take such course as usuall in schooles by custos, monitor or otherwise." That in times when manners were rough and when the system of fagging (*q.v.*) began to be ingrafted on the prefect system, the prefectural power was sometimes or even often abused and much misery caused thereby, there can be no doubt. But oppression of the weak by the strong is incident to all systems, and much worse where there is no system. No abuse of a prefect system could be so bad as the abuse of the usher system, the system of espionage by undermasters, characteristic of the Jesuit schools and said to be even now prevalent in schools in France, except in the most recent schools based on the English model. Effective protests by rebellion against the abuse of prefect power are on record in the late eighteenth and early nineteenth centuries at Winchester and Rugby. With modern and more democratic ideas in the state, the prefect system has been modified in the schools, especially in the element of punishment. Etonians sometimes write as if it did not now prevail at Eton because their Præpostors are now nearly formal officials as such. But the powers of "Pop" and of seniors in houses and the like are not perhaps wholly well regulated substitutes for them. Any one who has had experience of the prefect system as now in vogue at Winchester or Harrow, and who sees what the absence of such a system can produce in *Stalky and Co.*, or in certain French schools, cannot but feel thankful that the provisions of William of Wykeham still set the fashion of self-government of boys by boys in English public schools. A. F. L.

See FAGS; MONITORIAL SYSTEM; SELF-GOVERNMENT OF STUDENTS.

PREMIUMS. — See EMULATION; PRIZES.

PREPARATION. — The first stage in the formal method of the recitation. It prepares the way for further teaching by invoking the problem which is to supply purpose and motive in subsequent activities. H. S.

See APPERCEPTION; HERBART; RECITATION, METHOD OF.

PREPARATION OF TEACHERS. — See TEACHERS, TRAINING OF.

PREPARATORY SCHOOLS. — In the United States this term is used of those private secondary schools which prepare for college. In England it is applied only to those schools which prepare pupils from six to twelve or thirteen years of age for the "Public Schools."

See PRIVATE SCHOOLS; PUBLIC SCHOOLS.

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PRESBYTERIAN COLLEGE BOARD. — See COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

PRESENTATION. — The second characteristic step or stage in the formal method of the recitation, wherein new experiences or details of experiences are presented to the pupil. H. S.

See APPERCEPTION; HERBART; RECITATION, METHOD OF.

PRESENTATION SISTERS. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

PRESSBURG, ROYAL ACADEMY OF. — An institution which is located in the Hungarian city of that name (Pozsony) and consists of the faculties of law and political science and courses in philosophy. A high school was established in Pressburg as early as 1465 by King Matthias Corvinus, who reëstablished the University of Ofen (see BUDA-PEST) several years later. The Turkish invasion, which took place in the first half of the following century, soon put an end to the institution. In 1783 the *University* of Ofen was transferred to Pest, and a year later the *Academy* of Ofen was transferred to Pressburg. In 1910–1911 the Academy had an enrollment of about 250 students, the teaching staff consisting of a dozen instructors. The library possesses about 25,000 volumes. Pressburg also contains an evangelical theological academy, founded in 1891, and the city archives, established as early as 1291. The Hungarian Minister of Education announced at the beginning of 1912 the introduction of a bill to raise the Academy to the status of a University to include a medical school. R. T., JR.

PRESSURE. — One of the cutaneous sensations. The pressure spots are scattered everywhere over the external skin and in the cavities of the mouth, nasal passages, etc. They range between 10 and 250 to the square centimeter, with an average according to Von Frey of about twenty-five. The skin between the pressure spots gives no sensation unless strongly stimulated, and then the pressure is assumed to be communicated to pressure spots in neighboring regions. The sense organs of pressure are said by Von Frey to be the nerves at the roots of the hairs, where there are hairs, and on the palms and soles of the feet, where hairs are lacking, to be the Meissner corpuscles. W. B. P.

See PAIN.

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PREVIOUS EXAMINATION. — The entrance examination of "Little-go" at Cambridge University. All candidates must satisfy the examiners in Parts I and II. *Part I* includes: Greek Gospel (or an additional paper in Greek or Latin); Greek (translations of passages from prepared or unprepared books, with grammar questions); Latin (translations of passages from prepared or unprepared books, the latter for all candidates, use of a dictionary being allowed). *Part II* includes: Paley's *Evidences* (Elementary Logic) or elementary heat and chemistry; geometry, practical and theoretical; arithmetic; elementary algebra; English essay. Candidates for honors must satisfy the examiners in "additional" subjects; mechanics and the elements of trigonometry; French or German.

See CAMBRIDGE, UNIVERSITY OF.

PREYER, WILLIAM. — See CHILD STUDY.

PRIDE. — See SCHOOL MANAGEMENT.

PRIESTLEY, JOSEPH (1733–1804). — Nonconformist theologian and scientist, born at Fieldhead in the West Riding of Yorkshire. He was educated at the Bateley Grammar School and by a congregational minister. From sixteen to twenty, owing to ill health, he was unable to attend any institution and studied philosophy and Arabic, Chaldean, and Hebrew, and also, with a view to a commercial life abroad, French, German, Italian, and mathematics. In 1752, however, he decided to enter the ministry, and joined the nonconformist academy at Daventry. In 1755 he was appointed minister at Needham Market in Suffolk, and three years later at Nantwrich, where he opened a school. In 1761 he became tutor in classics at an academy in Warrington, and in addition to the classics gave lectures in history, and carried on experiments in electricity which led to his appointment as fellow of the Royal Society in 1766. From 1767, when he was called to Mill Hill Chapel, Leeds, he devoted himself almost wholly to the study of theology and science, a field in which he achieved a reputation as the discoverer of oxygen and other gases. As literary companion of Lord Shelburne from 1772 to 1780 he had opportunities of visiting London and the Continent, where he came into touch with the leading scientists of the day. His excursions into politics when he was minister of the New Meeting at Birmingham brought him into great popular disfavor which expressed itself in the burning of his house, books, and apparatus. After a brief stay in London he migrated to America and settled at Northumberland, Pa., where he died in 1804. While preëminently a theologian and scientist, Priestley showed a great interest in education. His writings in this field were collected under the title *Miscellaneous Observations Relating to Education more especially as it Respects the Conduct of the Mind to which is added an Essay on a course of Liberal Education for Civil and Active Life* (Cork, 1780). Evidences of familiarity with the work of Rousseau and the subsequent naturalistic movement may be traced. At the same time the beginnings of the utilitarian tendency may be recognized in his educational writings, and it was from Priestley (*Essay on Government*) that Bentham borrowed the phrase "the greatest happiness of the greatest number." "The chief and proper object of education," according to Priestley, "is not to form a shining and popular character, but an useful one, useful according to the sphere in which a person lives." Hence he advocates a different type of education for each class in society, but "consistent character," "pursuit of truth," and the "practice of virtue" underlie each one. As for the classical studies, Priestley recognizes their importance but also insists that changed conditions require changes in plans of education, and that the vernacular is also valuable. In his *Essay on a Course of Liberal Education for Civil and Active Life* Priestley advocates the study of history in general, the history of England, and the present constitution and laws as a general preparation for the ordinary citizen who is not to be a member of one of the learned professions. To this *Essay* he appends syllabuses on each of the courses which he himself gave at the Warrington Academy and which were recommended at Cambridge by John Symonds (1729–1807), professor of modern history. Priestley's educational work is of considerable interest in the history of English education, since it mirrors to a large extent not merely the personal bias of the scientist, but a theory of education formulated and put into practice in many of the nonconformist academies (*q.v.*).

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PRIMARY GRADES. — The four grades extending from the first through the fourth elementary school years are the primary grades. When a school consists merely of the pupils belonging to the first five school years, all the grades included are frequently termed primary grades. In the broad meaning of the term, kindergarten classes are also included among the primary grades. H. S.

See GRAMMAR GRADES; ELEMENTARY SCHOOLS; GRADING AND PROMOTION.

PRIMARY GRADES AND THE KINDERGARTEN. — See KINDERGARTEN.

PRIMARY SCHOOL. — A term now used somewhat generally in the United States to designate the first four years of the elementary school course. In some New England towns the term "intermediate school" is still used, and where this is the case the term "primary school" is then usually employed to designate only the first three school years.

See ELEMENTARY SCHOOLS.

PRIMER AND PRIMARIAN. — It is disputed whether a primer owes its name to being a first or primary book on any subject, or to its being used at the first hour or *prime*, as the original primer for teaching Latin, or English, was a book of private devotions used at that hour. The chief objection to the latter derivation is that the devotional primer began with matins, which were supposed to be said at or before dawn, considerably before *prime* or the first hour at six o'clock. It has been claimed that the primer was the lay folk's prayer book. But Dr. Littlehales, who seems disposed to insist on the latter meaning, by way of showing that the medieval church did not try to keep the lay folk in religious darkness, has practically disposed of the claim by showing that the primer was really derived from works of supererogation in the way of devotion by ninth century monks, who, having ceased more or less to perform manual labor, had to fill up their time somehow, and when especially zealous did it by additional services. However that may be, it is certain that the primer or book of devotions, once conceived, served as a schoolbook for young ecclesiastics, clerks, and schoolboys. The earliest use of the word *primer* appears to be found in a list of books in 1294 of Matthew of the Exchequer, "*unum Primarium.*" In 1323 a lady at Lincoln bequeaths a "primer which was my sister Margaret's." It was no doubt very early used as a schoolbook because it contained the most important of the psalms, the seven Penitentials, and the fifteen Graduals, and the Hours of Our Lady, the first object of every schoolboy's instruction in learning to read. But the first known definite proof of its being so used is in Chaucer's *Prioress's Tale* — "This litel child his litel book-lerninge As he sat in the scole at his prymer." This was in a song school, where the child did not learn grammar. But in an Ipswich ordinance settled by the bishop of Norwich in 1477 we find three grades of scholars attending the grammar school and the "primarians" or those learning the primer amongst them. The grammar schoolmaster was directed to charge 10*d.* a quarter for grammarians, 1*d.* for psalterians, and only 6*d.* for primarians (*pro primario*). It is strange to find the distinction thus drawn between boys learning the psalter (*saltario*) and those learning the primer, which contained a large slice of the psalter. But there was a further distinction. The "Apesyes" (*i.e.* A B C's, those learning the alphabet only) and "Songe" (or those learning singing only) were excluded from the grammar schoolmaster's jurisdiction altogether and left no doubt to the song schoolmaster, who probably was not one but divers. This ordinance looks as if the primer by that time had become like the later primers mentioned by Sir Thomas More, and the Protestant hornbooks, which began with the graces before and after meat. Sir Thomas More complains that the Lutheran primers omitted these as superstitious. A reformed primer was set forth by Marshall in English in 1534. The diversity of primers was one of the points taken up by Henry VIII in his love of law and order and uniformity, and he set forth in 1565 a primer with the Pater Noster, Ave Maria, Credo, and Ten Commandments. In 1547 Edward VI set forth *Injunctions* to use no other primer, whether English or Latin, than that set forth by the King's authority, Winchester. The primer continued in use to the eighteenth century. A. F. L.

New England Primer. — The title of one of the most frequently published and most widely used books bearing the character both of a beginners' reading book and of a catechism, the book which "taught millions to read and not one to sin." It was a lineal descendant of the *Primer* of the English Reformation (*e.g.* the Reform Primer, 1534; the *Goodly Prymer in Englysshe*, 1535; Henry VIII, the Primer). Many unauthorized editions appeared, especially in Scotland and Dublin. With these primers were in time combined the A B C books in one volume. In New England the number of catechisms multiplied rapidly after 1641 to such an extent that separatist tendencies rather than uniformity was encouraged. The immediate predecessor of the famous *New England Primer* was the *Protestant Tutor*, issued at some date before 1686 by Benjamin Harris, a London printer who was frequently in difficulties with the authorities and visited New England several times. A later edition of the *Protestant Tutor* included the alphabet, syllabarium, alphabet of lessons, the Lord's Prayer, the Creed and Ten Commandments, the poem of John Roger with the picture of his burning, the "figures and numerical letters," and the names of the books of the Bible. It was this work which Harris abridged with an increase in favor of the school work and published during a stay in Boston (between 1687 and 1690) under the famous title, the *New England Primer*. The earliest known fragments of this work were found in a book published by Wm. Bradford, in Philadelphia or New York between 1687 and 1700. The book met with instant success in both New England and Old England, where Harris published a new edition in 1701 under the title: the *New England Primer Enlarged; For the more easy attaining the true Reading of English. To which is added the Milk for Babes.* The work was reprinted in England, Scotland, and America down to the nineteenth century, and in the changes which it underwent gives significant evidence of the development not only in theology but in the attitude to children and children's literature (*q.v.*). According to Mr. Ford "an over-conservative claim for it is to estimate an annual average sale of twenty thousand copies during a period of one hundred and fifty years, or total sales of three million copies." Its very popularity, however, seems to have militated against its preservation, for copies of the book are very rare; there is no copy of a seventeenth century edition and few of the eighteenth.

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PRIMITIVE PEOPLES, EDUCATION AMONG. — Anthropological treatises are commonly deficient in the information they convey regarding the primitive child, his nurture, training, and condition, amongst the lower races of mankind. It is often considered that the savage boy or girl receives little direct preparation for the duties and occupations of life. This, however, is by no means an accurate view of the matter. Many "nature-peoples" of to-day possess their own systems of instruction and discipline to which the term "education" may very properly be extended.

A complete study of primitive education would involve an examination of each separate people in relation to its particular environment — geographic, economic, and social. It would be necessary to show how in every case the educational system is definitely related to the special activities of the group in question. Within the compass of the present article no more can be done than to set forth certain general aspects of the subject which are measurably independent of local conditions, geographical situation, and the stage of culture attained by any given people.

Treatment of Children. — In primitive society boys and girls often enjoy a considerable measure of freedom from parental restraint. Sometimes freedom passes into license and, as a consequence, the children grow up wayward and self-willed and do very much as they please. Under such conditions a distinct obstacle is interposed in the way of early training. Concerning the Dyaks of Borneo, Mr. Brooke Low declares: "They are fond of their children, and the children are fond of them. Indeed, the latter are quite spoilt, and the more mischievous a boy is, the prouder they are of him, and prognosticate great things from him when he gets older" (Roth, *The Natives of Sarawak and British North Borneo*, London, 1896, Vol. I, p. 102). At Tahiti and in other Polynesian islands, no regular parental discipline was preserved.

On the other hand, there are not wanting many instances of regular parental discipline, though this is usually secured without a resort to corporal punishment. Forres Straits children are seldom disobedient, but even at such times they are never whipped (Haddon, in *Reports of the Cambridge Anthropological Expedition to Forres Straits*, Vol. VI, p. 111). Among the Andaman Islanders a child will be reproved for being impudent and forward, "but discipline is not enforced by corporal punishment" (Man, in *Jour. Anthrop. Inst.*, Vol. XII, pp. 93 *sq.*). In South Africa the problem of discipline scarcely troubles Kafir parents. "Respect for old men, and especially for a father, is most marked. The parents are very fond of their children, and treat them very well on the whole, never fussing about trifles. They seem to have the knack of keeping children in order. Every child knows quite well what it may and may not do" (Kidd, *Savage Childhood*, p. 98). The Pimas of Arizona seldom whip their children, though the latter may be scolded, slapped, or shaken for their misconduct until they reach ten or twelve years of age (Russell, in *Twenty-sixth Ann. Rep. Bur. Amer. Ethnology*, p. 191).

Such diverse attitudes towards children might naturally be expected to appear as the outcome of a wide comparative survey. The reluctance to punish children cannot itself be referred to a single cause. Oftentimes, of course, it is due to excess of fondness. Savages, as a rule, display abundant affection towards their offspring, and this, not infrequently, leads to a reluctance to deny their requests or punish their misdeeds. In many instances the idea seems to be that punishment degrades and weakens the child. The boy must be allowed to grow up strong of will, independent in spirit, if he is to fulfill his whole duty as a tribesman, both in battle and council. Sometimes pure superstition is the controlling motive as among the inhabitants of the East India islands. Here it is believed that when a person is discontented for any reason, his soul-substance feels uncomfortable and is likely to depart from the body. The natives are, therefore, very unwilling to refuse a request, especially in the case of children. "When a child has worried its parents beyond endurance and receives a smacking, its screams cause an immediate revulsion of feeling. It is no longer the child that is blameworthy; it is the parents. They feel that its soul-substance may go away, and that they can never forgive themselves" (A. E. Crawley, *The Idea of the Soul*, London, 1909, pp. 131 *sq.*).

In general, however, it is probable that the freedom possessed by primitive children is more apparent than real. Discipline and instruction are secured less by threats and penalties than by a reliance on moral suasion, by an appeal to feelings of pride or shame, by employing the stimulus of praise, flattery, or disparagement. In the later years of childhood these motives are powerfully reënforced through the training received in the initiation rites.

Education by Play. — Like the modern boy or girl the savage child is early occupied with various forms of play which not only amuse him, but serve as well to strengthen his muscles, arouse his intellect, and develop his powers of observation, imagination, and invention. Many games are mimetic in character. The child imitates in play the serious occupations of adult life. Dyak toys include well-made models of boats, little shields, spears, and swords, and tiny bows and arrows (Roth, *op. cit.*, Vol. I, p. 104). In Dutch New Guinea boys of four or five years of age, by practicing with small models, learn to use the native *isja*, a canoe which capsizes very readily. In a few years they are able to manage the large boats with the greatest confidence (Van der Sande, *op. cit.*, p. 196). In British New Guinea, Haddon was fortunate enough to see the children playing games — a pig hunt and a kangaroo drive — in which the actions of their elders were vividly enacted. In another game, several boys, disguised in a dress of banana leaves, chased the girls about and made them scream. This was done in imitation of the procedure of the masked men who formed a secret society in their village and frightened the women (*Head-Hunters*, London, 1901, pp. 274 *sqq.*). Of the games played by Omaha Indian children, Miss Fletcher remarks: "Going on the hunt, with all the stir of preparation; taking down and putting up tents, the tall stalks of the sunflower serving as poles; the attack of enemies, the meeting of friendly tribes and their entertainments, — all these furnish incidents for days and days of play" (*Jour. Amer. Folk-Lore,* 1888, Vol. I, p. 119). The leading occupations of the Pueblo Indians — agriculture, hunting, the making of pottery and implements, weaving and building — are all imitated in the games of the children (Spencer, in *Columbia University Contributions to Philosophy, Psychology, and Education*, Vol. VII, p. 77).

Training through the Family. — *Practical.* — The unconscious training yielded by play and by other spontaneous activities of the primitive child is usually supplemented at an early age by the direct tuition of parents, grandparents, or guardians. The instruction they provide deals mainly with the practical arts of everyday life. The aim is to fit the child, as soon as possible, to take care of itself and be of assistance in the family. The sons participate in the work of the father; the daughters learn domestic science from their mother. In Australia, among the Victorian tribes, whilst the child is still very small and able to move only on hands and knees, a little digging-stick is put into its hands. Following the example of elder brothers and sisters, the infant searches for roots, for the larvæ of ants, and for such living things as it can find in decayed wood. Very soon the child learns to kill small lizards and other animals which enter into the tribal dietary (R. B. Smyth, *The Aborigines of Victoria*, Melbourne, 1878, Vol. I, p. 48). As the Australian boy grows up, he is taught to throw the spear, to use the stone tomahawk, shield, and club. He learns how to climb trees and how to employ the net for fishing. He is trained to follow the tracks of animals and to recognize by the faintest indications the near presence of birds and reptiles. Thus he gains in the open air and by constant practice the field craft indispensable for the life he leads. In like manner an Australian girl learns how to build huts, to collect gum, to gather rushes and weave them into baskets, to twist the woolly hair of the opossum into a kind of yarn (Smyth, *op. cit.*, Vol. I, pp. 49 *sq.*). Torres Straits children very early in life were expected to collect shellfish and other edible animals found on the reefs at low tide. Every boy had a small bow and arrows with which he shot birds, and little pronged spears for transfixing fish. As soon as he could manipulate the digging-stick, he was considered able to cater for himself (Haddon, in *Jour. Anthrop. Inst.*, Vol. XIX, p. 359). The training of Andamanese boys followed similar lines. They were provided with miniature weapons suitable to their age, and were instructed in the use of them. As they grew older they accompanied the men on hunting and fishing expeditions, and soon gained sufficient skill to be very helpful (Man, *ibid.*, Vol. XII, p. 329). New Guinea children help their mothers in tilling the fields, serve as drivers in boar hunts, assist in fishing, and attend to the laborious task of grinding and polishing stone implements (Van der Sande, *op. cit.*, pp. 155, 167, 175 *sq.*). A Samoan girl is taught by her mother to draw water, gather shellfish, make mats and native cloth. The boy, under his father's training, soon becomes useful in planting, fishing, housebuilding, and all kinds of manual labor (George Turner, *Nineteen Years in Polynesia*, London, 1861, p. 177). Kafir parents wisely allow their children to regard much of the work they do as a sort of play. The girls carry babies on their backs, "the nurse frequently being but little larger than the baby" (Kidd, *The Essential Kafir*, London, 1904, p. 17). They fetch wood and water, look after the weeding of the gardens, help in reaping the crop, winnow the grain, grind it and cook it. The chief occupation of the boys consists in herding the cattle which are kept at night in the *kraal* and driven out to pasturage in the morning. During the months when the corn is ripening, all the children of both sexes are sent into the fields to scare away the birds. This is the chief occasion on which boys and girls mix, and the first work to which they are set (Kidd, *Savage Childhood*, pp. 187, 206 *sq.*, 214). Among the Unyamwesi, "as soon as the boy can walk he tends the flocks; after the age of ten he drives the cattle to pasture, and considering himself independent of his father he plants a tobacco plot and aspires to build a hut for himself. There is not a boy 'which cannot earn his own meat'" (R. F. Burton, *The Lake Regions of Central Africa*, New York, 1860, p. 295). The Bororo of Brazil, an aboriginal tribe, send their children to the *bahito*, or men's house, as soon as they are weaned, an event which does not take place before their fifth or even their seventh year. The *bahito* is "a public school where the children are taught spinning, weaving, the manufacture of weapons, and above all singing, upon perfection in which is centered the ambition of all those who wish to become chieftains" (Frie and Radin, in *Jour. Anthrop. Inst.*, Vol. XXXVI, p. 388). Pueblo children are taught to work as soon as they can be at all helpful to their parents. Thus little girls of five or six years assist in caring for the younger children, fetch wood and water, and even help to prepare the clay for the pottery and the materials for basket weaving. As the children grow older they take gradually a larger share in the occupations of the men and women (Spencer, *op. cit.*, pp. 77 *sq.*).

Moral. — In addition to this training in practical arts, there is, not infrequently, an effort to impart during the earlier years of childhood the elements of a code of morals. Thus, for example, Dieri elders in their leisure moments will instruct the younger men in the laws of the tribe, "impressing on them modesty of behavior and propriety of conduct as they understand it, and pointing out to them the heinousness of incest" (A. W. Howitt, *The Native Tribes of South East Australia*, London, 1904, p. 300). Every Pima child receives careful oral instruction in moral, religious, and other matters. The boy has to sit up very straight and pay strict attention while his father or guardian tells him of the conduct befitting a Pima warrior and gentleman. "If he was not fully awake and paid indifferent heed to what was told him, the father's stiffened middle finger would suddenly strike the side of his nose, bringing his face around until he looked straight into his father's eyes" (Russell in *Twenty-sixth Ann. Rep. Bur. Amer. Ethnology*, p. 190). Where initiatory ceremonies are found in a primitive community moral instruction of this sort holds a very prominent place.

Initiation Ceremonies. — Until the age of puberty, a period which arrives somewhat earlier among nature-peoples than among civilized races, the child's care and training centers naturally in the family. But on the approach of puberty this preliminary preparation for the duties and responsibilities of life is often supplemented by various ceremonies initiatory to manhood. These rites, in the lower stages of culture, are most commonly in charge of the elders of the community who employ a period of awakening mental and emotional life for the inculcation of useful lessons, practical, moral, and religious. Such initiation rites are found amongst peoples considered the lowest of mankind, as the Australians, Andaman Islanders, Hottentots, and Fuegians; and they exist in various forms amongst many other peoples who have passed from savagery to barbarism. It is probable that in their origin they go back to certain very widespread ideas of contagion regarded by the savage mind as especially threatening at a great functional crisis like puberty. On this theory the puberty ceremonies are intended to ward off or neutralize the evil influences manifest at such a time. In their practical operation, however, the initiatory rites, as they exist to-day, are chiefly significant as providing a systematic course of instruction for the youth of both sexes in those matters deemed of highest importance to the community. Initiation is the savage school.

Although there is wide variation in details, the leading features of the puberty rites reproduce themselves with substantial uniformity throughout the uncivilized world. On the arrival of puberty, boys, and often girls, are carefully secluded from the community at large, and, as a rule, are confined for a lengthy period in some special abode, remote from the settlement. They are debarred from all intercourse with the opposite sex. They undergo various ceremonies of a purificatory character. They are obliged to fast — either total abstinence from food for a time or partial abstinence from certain customary articles of diet and much-prized dainties. Almost universally, the rites include a mimic representation of the death and resurrection of the novices. They have now "died" to the old life of irresponsible childhood and to their childish ways. Usually they receive at this time a new name and learn an esoteric speech, both known only to the initiated. In the course of initiation the candidates are subjected to a number of ordeals, frequently of a brutal or disgusting sort. Such bodily mutilations as the knocking out of teeth, scarification, and tattooing leave permanent records on the body of the novice and serve to indicate his reception into the ranks of initiated men. Another very common rite is circumcision. Still other ordeals seem to have no other *raison d'être* than the mere desire to test the manly qualities of the candidate and to strengthen him in the endurance of pain and privation. Sometimes they are so severe as to ruin the health, and even to cause the death, of the weaker novices. Those who succumb are thought unfit for manhood, and for them there are few regrets. The "fittest" are those individuals who can face the greatest hardships with Spartan fortitude. Unwillingness to submit to these ordeals and inability to withstand them are not common. The savage lad realizes that an uninitiated man is a pariah who, if he be not expelled from the tribe, is subject to constant ridicule and abuse. The arrival of puberty finds him, therefore, only too anxious for initiation. However painful may be the trials and restrictions imposed on him, the candidate is ready to fulfill them with the most scrupulous care.

Educational Value of the Initiation at Puberty. — The instruction received by the candidates during their initiatory seclusion embraces a wide range of topics. In Australia it is at this time that the boys are taught the very complicated rules relating to the marriage system. They become familiar with the sacred traditions and lore of the tribe, the boundaries of the tribal territory, and the reasons for the feuds with neighboring communities. They learn how to play the native games, to sing the sacred songs, and to dance certain "corroborees," which neither the women nor the uninitiated men are permitted to practice. Boys of the Kurnai tribe, after initiation, spend months in the bush as probationers. They are under the watchful care of guardians, "gaining their own living, learning lessons of self-control, and being instructed in the manly duties of the Kurnai, until the old men are satisfied that they are sufficiently broken in to obedience, and may be trusted to return to the community" (Howitt, *op. cit.*, p 637). The boys are told to obey the elders, to live peaceably with their friends and share all they have with them, to avoid interfering with the girls and married women, and to observe various food restrictions. In Africa the Bawenda, a Bantu tribe of the Transvaal, isolate their children for three or four months. During this time the lads are under the charge of responsible headmen who spend much effort in teaching the boys sound principles for their future guidance. "They are warned against certain wrong and vicious habits, and encouraged to be faithful and loyal subjects to their chief, and to be good husbands and fathers. The gathering is known among the natives as 'School,' a term probably adopted since the advent among them of missionaries" (Grant, in *Jour. Anthrop. Inst.*, Vol. XXXV, p. 268). Novices belonging to Lake Nyassa tribes are harangued by the elders, bards, and magicians. "They are now men, and men's work is to be theirs. Herding, hoeing, reaping, and all domestic duties in which they assisted their mothers, they have no longer any concern with. War, hunting, and hearing causes must now occupy their thoughts, for they are to take the place of the fathers, and on them will depend the defense of the tribe and the maintaining of its honor" (Macdonald, *ibid.*, Vol. XXII, pp. 100 *sq.*). The Yao initiatory rite called *unyago* is especially elaborate. During the months spent in the bush the novices receive instruction from teachers, of whom every boy has one. "They watch over their pupils through the painful weeks of the *unyago*, teach them what is fitting and unfitting, and remain responsible for their welfare even after they have left their boyhood far behind" (Karl Weule, *Native Life in East Africa*, London, 1909, p. 188). Vey boys in Liberia during a year's seclusion receive instruction in war, hunting, fishing, and other manly arts. They are trained to withstand hunger and thirst, to fight bravely, and in all cases to redress wrongs and protect the weak. Especially are they taught how to form judgments on matters of tribal importance, in order later to be able as men to take part in the deliberations of the council-house (J. Büttikofer, *Reisebilder aus Liberia*, Leiden, 1890, Vol. II, p. 305). Girls belonging to the same Liberian people go into retirement when ten years old and remain under instruction until of marriageable age. Various womanly duties — the care of children, cooking, making of nets — besides dances, games, and songs are taught them (Penick, in *Jour. Amer. Folk-Lore*, Vol. IX, pp. 220–221). While the Fuegian youth were confined in the *kina* or lodge, their elder brothers, their uncles, and older cousins urged them to be industrious, generous, and sincere, warning them that they would be unhappy if they did wrong (*Mission scientifique du Cap Horn*, Vol. VII, p. 376). At the initiation rites of the Diegueños Indians of Southern California the boys "were instructed in their future duties as members of the tribe and participants in the ceremonies, and were threatened with dire punishment if they should prove recalcitrant" (Miss Dubois, in *Amer. Anthropologist*, N.S., Vol. VII, p. 623).

In addition to practical arts and moral duties the curriculum of these savage schools often includes specific religious teachings. Especially does this appear to be true in Australia. There the mysteries possess a sacred character and enshrine the inner faith of the people. The initiatory rites are believed to have been instituted by the tribal gods who still watch over them. At the ceremonies novices are shown their images, rude affairs of sticks and mud, are taught to pronounce their secret names, and are further instructed in all the legends relating to them. According to Mr. Howitt, these ceremonies provide "a rude form of religion, which is taught to the youthful Australian savage in a manner and under circumstances which leave an indelible impression on his after life" (*Report of the Australian Association for the Advancement of Science*, Vol. III, p. 349). In North America, Mr. Hoffman remarks that the Ojibwa traditions "of Indian genesis and cosmogony and the ritual of initiation into the Society of the *Mide* constitute what is to them a religion, even more powerful and impressive than the Christian religion is to the average civilized man" (*Seventh Ann. Rep. Bur. Ethnology*, p. 151).

It must not be supposed that these teachings are exclusively theoretical in character. Savage ingenuity, indeed, exhausts itself in devising methods for working on the curiosity and awe of the novices. Some of the initiatory rites are even of a pantomimic nature, intended to teach the children in most vivid fashion what things they must henceforth avoid. In some Australian performances the guardians of the candidates talk to each other in inverted language so that the real meaning of their words is just the opposite of what they say. The lads are told that this is to teach them to speak the straightforward truth. Various offenses against morality are exhibited, and the guardians warn the novices against repeating the actions they have just seen. In one ceremony "two old men sat down on the ground, in front of the novices, and proceeded, with most ludicrous antics, to make a 'dirt-pie,' after the manner of children, while the men danced round them. The guardians told their charges that this was to show them that they must no longer consort with children and play at childish games, but for the future act as men" (Howitt, in *Jour. Anthrop. Inst.*, Vol. XIII, p. 448). Such "homœopathic" performances as these must make a lively appeal to the imagination of the novices. They constitute, in fact, the elements of an impressive morality play.

Conclusions. — The foregoing examples suffice, perhaps, to indicate the wide diffusion of initiatory rites and the general character of the instruction received by novices. Such rites, together with the instruction given in the earlier years of childhood, may be said to constitute primitive education. This educational system is *inclusive,* since it embraces not only economic pursuits, hunting, fishing, agriculture, and industry, but also the customs, etiquette, legends, art, morals, and religion of the community. It is a system essentially *social* in character. It has little concern with the upbuilding of the individual. Its shibboleths are not culture, or self-realization, or mental discipline, but the solidarity of the group. In general, its method is that of *imitation;* the learner follows more or less blindly the procedure and patterns as set forth by his elders or superiors. By constant practice he acquires the dexterity required to do things as they have been done century after century before him. Finally, primitive education is distinctly *unprogressive*, serving rather to perpetuate existing conditions than to introduce an element of unrest and progress. The initiatory rites, in particular, are a chief means for preserving that uniformity and unchangeableness of custom which is a leading trait of primitive society. They tend not to encourage, but to repress, every favorable intellectual variation, and to keep all the members of the tribe on one monotonous level of adherence to the tribal traditions.

At the same time it is obvious that from the native standpoint the educational system outlined here is by no means a failure. It does what it is intended to do. On the practical side it assures the preservation of the learning and occupations of the past, and sets a standard, however low, which all must reach. Such a system makes for social stability. On the moral side there can be no question as to its effectiveness. The initiatory training, in particular, has lasting results on the character of the novices. Impressions conveyed in so striking a fashion lead to something more than a temporary "conversion"; the boys become indeed "men" and are now ready to accept the responsibilities and duties of adult life. It is not easy to imagine a surer method for a rapid but thorough training. The absence of any counterpart of the puberty rites in modern secular life indicates a serious failure in correlating our own systems of education with the great crisis of physical and psychic development. H. W.

See Indian, Native Education of the.

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PRINCE EDWARD ISLAND, EDUCATION IN. — See Canada, Education in.

PRINCES, EDUCATION OF. — See Gentry and Nobles, Education of.

PRINCETON THEOLOGICAL SEMINARY, PRINCETON, N.J. — Established in 1812 by the General Assembly of the Presbyterian Church in the United States of America, the work of instruction beginning in August of that year. Three students were present at the opening, and eleven more were admitted during the session. In the course of one hundred years 5967 students have been matriculated, coming from nearly every state of the Union and from foreign countries. The enrollment in 1911–1912 was 185. Of the matriculants 396 have entered upon foreign mission work. More than 3000 of the former students are now living. The faculty at present numbers twelve professors and four instructors. The library contains 92,000 bound volumes and 32,000 pamphlets. The faculty conducts a quarterly, bearing the title

The Princeton Theological Review. The seminary grants no degree on the completion of the curriculum. The degree of Bachelor of Divinity is conferred for advanced work only, and only upon graduates of theology from this seminary or other theological school who hold the degree of Bachelor or Master of Arts or a similar certificate. J. D. D.

PRINCETON UNIVERSITY, PRINCETON, N.J. — Historical Sketch. — Princeton University was originally chartered as the College of New Jersey on Oct. 22, 1746, and the college was opened at Elizabethtown (now Elizabeth) in May, 1747, under the presidency of the Rev. Jonathan Dickinson. The original charter proving inadequate, a second charter was obtained, which passed the seal of the Province of New Jersey on Sept. 14, 1748. Upon the death of President Dickinson, in October, 1747, the Rev. Aaron Burr was elected president, and with his accession the college was transferred temporarily to Newark. The choice of a permanent location lay between New Brunswick and Princeton, the selection of Princeton being decided upon because of the generosity of the residents of the town, who offered 1000 pounds proclamation money, two hundred acres of woodland, and ten acres of cleared land for the establishment of the college. The new college building, which was completed in 1756, was at the time the largest college building in the colonies. It was named Nassau Hall, in honor of King William III of England, a member of the House of Nassau, at the suggestion of Governor Belcher of New Jersey, who modestly declined the request of the Trustees that he allow the college to be named after him. The college was opened at Princeton in the fall of 1756. President Burr died in September, 1757, and was succeeded by the Rev. Jonathan Edwards of Stockbridge, Mass., who lived only a few months after arriving at Princeton.

The College of New Jersey attained much prominence during the War of the Revolution. Its President, John Witherspoon, took a very active part throughout the struggle, and was one of the signers of the Declaration of Independence. Among the students of the college who became leading figures in the war and in the solution of the constitutional problems which the successful outcome of the war produced were James Madison, Aaron Burr, Gunning Bedford, William Bradford, Philip Freneau, Henry Brockholst Livingston, Hugh Henry Brackenridge, Morgan Lewis, and Henry Lee. During the war the course of instruction was interrupted by the presence at different times of both armies, Nassau Hall was wrecked, and the library of the college scattered and destroyed. Nassau Hall has been twice partially destroyed by fire, in 1802 and 1854; but it was rebuilt each time, and the original outer walls of the building are still intact.

The growth of the college was slow throughout the first half of the nineteenth century. In 1854 there were six professors, two assistant professors, and four tutors, and 247 students. In 1868, however, when James McCosh was elected President, a new era began. During his administration gifts of upwards of $3,000,000 were received, fourteen buildings were erected, the faculty was increased from ten professors and seven tutors to thirty-one professors, four assistant professors, and five instructors and tutors, and the number of students increased from 281 to 603. At this time the system of elective studies was introduced, the John C. Green School of Science was established, offering courses leading to the degrees of Bachelor of Science, Civil Engineer, and Master of Science; and the Graduate Department was instituted. The development and growth of Princeton has been chiefly along collegiate lines rather than in the establishment of professional schools, the only professional courses offered at present being in civil and electrical engineering. On the 150th anniversary of the signing of the first charter, Oct. 22, 1896, the title of the corporation was changed from the College of New Jersey to Princeton University.

Government. — The government of the University is in the hands of a Board of Trustees, consisting of twenty-five life members who are elected by the Board itself, and five alumni members who are elected by the alumni. The alumni trustees are elected one each year, to serve for five years, and are eligible for reelection. The Governor of the State of New Jersey is *ex officio* President of the Board of Trustees. While Princeton's foundation was due largely to Presbyterian interest, and Presbyterians have always been greatly concerned in its welfare, the charter and administration of the University are absolutely unsectarian, and the personnel of the Board of Trustees is not confined to any one denomination nor is it predominantly clerical. The work of the Board is done largely through standing committees, the more important committees being on finance, grounds and buildings, curriculum, graduate school, library and apparatus, and honorary degrees. The President of the University is *ex officio* a member of the Board of Trustees. He is in general charge of the administration of the University, and there are associated with him several deans who administer certain departments, *i.e.* the Dean of the Faculty, who is next in authority to the President and who has especial charge of matters relating to examinations and standing; the Dean of the Graduate School; the Dean of the Departments of Science; and the Dean of the College, whose especial field is that of discipline. The faculty is technically divided into two sections: the Academic Faculty and the School of Science Faculty, but these faculties seldom meet

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Princeton University.

separately, and the faculty business of the University is transacted in the meetings of the University Faculty, which comprises the professors and assistant professors in both the academic and scientific divisions. The instructors have the privilege of attending faculty meetings, but do not have a vote. The faculty is also organized according to departments, with a chairman or head over each who presides over the meetings of his department and reports to the President on departmental matters.

Educational Features. — Admission to the freshman class at Princeton is by examination only. A candidate must pass either the examinations set by the University or those set by the College Entrance Examination Board (*q.v.*). There are four undergraduate courses, leading to the degrees of A.B., Litt. B., B.S., and C.E. A student who has taken part of his undergraduate course at another institution may be admitted to Princeton and given credit for the studies of the Princeton curriculum which he has taken elsewhere.

In the nonprofessional undergraduate courses the work of the freshman and sophomore years consists almost entirely in prescribed studies of a rudimentary and fundamental character. In the junior and senior years a student is required to concentrate his work largely in one main department of study. In every case, however, he is obliged to take one course outside of his department and is free to elect one course as he pleases.

One of the distinctive features of Princeton's undergraduate educational program is the so-called "Preceptorial System." Instruction in what may be called the reading departments, philosophy, history and politics, art and archæology, and the languages is given chiefly by means of informal conferences on the reading assigned. A "course" consists, not of the lectures given in connection with it or of the study of a particular textbook relied on by the lecturer, but of a prescribed body of reading to which the lectures given are supplementary. Each student is made responsible to a particular preceptor for his reading, and reports to him at least once a week in each course for conference. He reports to the same preceptor throughout for all his reading in the several courses of the special department in which he has chosen to concentrate his work, and for his reading in the courses outside his special department to the lecturer in that course or to the instructor who has charge of its formal conduct in the classroom. At each conference the preceptor usually meets from three to six of the men assigned to him. The methods of conference differ, of course, with the character of the subject, but are always informal, being intended, not as quiz or recitation or drill, not as a method of coaching, but, so far as the preceptor is concerned, as a means of finding out how thoroughly and intelligently the student has done his reading and, so far as the student is concerned, as a means of stimulation and enlightenment with regard to the study in hand. His work is explained to him where it is obscure, and its scope and implications are extended out of the wider reading and maturer scholarship of the preceptor, whose real function is to serve him as a "guide, philosopher, and friend." Study centers upon these conferences, as in the scientific departments it centers upon the laboratory. They are meant to supply to study the life which it cannot have in the formal exercises of the classroom and to bring the students into an intimate contact with their teachers which is hardly possible in other methods of instruction. All members of the faculty do "preceptorial" work: those who lecture or conduct the formal class exercises acting as preceptors in so far as their other duties will allow, as well as those who bear the special title of Preceptor. The preceptorial system was established in 1905, in the presidency of Woodrow Wilson, and has had a notable success. There are some fifty preceptors in the Princeton faculty. They bear the rank and title of assistant professor. The establishment of this system increased the budget of the University by about $100,000 per year. It is largely supported by contributions from the alumni.

The Graduate School grants the degrees of Master of Arts and Doctor of Philosophy. It offers graduate instruction in philosophy, history, politics, economics, art and archæology, classics, Romanic languages, Germanic languages, English, mathematics, astronomy, physics, chemistry, biology, and geology. A handsome group of residential buildings, known as the Graduate College, is now in process of erection and will be completed in 1913. These buildings will provide a comfortable and attractive residence for some eighty graduate students amid surroundings which are expected to prove very attractive to the students and conducive to scholarly work. The University also maintains a School of Electrical Engineering with a two years' course of graduate work leading to the degree of Electrical Engineer.

Grounds and Buildings. — The University campus consists roughly of three tracts of land, adjoining each other, and comprising about 540 acres of land. The main college buildings are on the central portion, while the new buildings of the Graduate College are being erected on the western portion. The eastern portion contains a large tract of woodland and extends from the campus proper to Carnegie Lake. There are, all told, fifty-three University buildings; Nassau Hall, completed in 1756, is the oldest and historically the most interesting building on college property. It is now used as an administrative building. The University Library contains about 280,000 volumes. There are sixteen dormitories which house about 85 per cent of the undergraduates. The architecture of all of the recent buildings is collegiate Gothic.

Student Life. — Because of its location in a small town at a distance from the large cities, the student life of Princeton escapes the undesirable distractions of city life, and has naturally acquired a tone of frank simplicity and youthful enthusiasm. The undergraduates are thrown for their recreations upon their own resources and those of a generous outdoor world, their life together is closely knit, and their friendships are strong and intimate. One of the leading factors in the democracy of Princeton's undergraduate life has always been the fact that most of the undergraduates live in the dormitories. It is the desire of the university authorities to provide rooms for all of the students on the campus. The freshmen and sophomores are required to board at the University commons, while eating accommodations are also provided there for as many upperclassmen as desire to use them. Most of the juniors and seniors, however, are members of and dine at the so-called "Upper Class Clubs." There are at present fifteen such clubs, each having an undergraduate membership of about thirty men.

Registration. — The total student enrollment for the current year (1911–1912) is 1543, classified as follows: Graduate School, 143; School of Electrical Engineering, 9; Seniors, 312; Juniors, 296; Sophomores, 298; Freshmen, 395; students qualifying for regular standing, 85; specials, 5. The teaching staff consists of 72 professors; 53 assistant professors or preceptors; four lecturers; and 53 instructors and assistants. John Grier Hibben, Ph.D., LL.D., was elected President in January, 1912, succeeding Woodrow Wilson, Ph.D., LL.D., who resigned in October, 1910.

G. F. C.

PRINCIPAL. — The chief educational officer in responsible charge of a school. When a principal is assigned to the supervision of several schools in the same neighborhood, he is called a supervising principal. H. S.

See Supervision.

PRINCIPLE. — See Generalization; Law.

PRINCIPLES OF EDUCATION. — A term in frequent use in American institutions to indicate the general field often designated as the science or philosophy of education. The term is used to avoid the use of the term "pedagogy," somewhat in disrepute, and of philosophy of education, as having a metaphysical connotation. The usual approach to the subject is through an attempt to formulate biological, psychological, and sociological as well as philosophical "principles." The entire subject, however, is discussed, as it may properly be, under the caption of Philosophy of Education. See also Education, Academic Study of.

See references under titles given above.

PRINTING AND PRINTERS. — See Renaissance and Education.

PRINTING, FORMS OF. — See Reading, Psychology and Hygiene of.

PRISCIAN or PRISCIANUS CÆSARIENSIS. — A Latin grammarian who lived the latter part of the fifth and the early part of the sixth centuries. He taught at Constantinople and published about 526 A.D. his *Institutiones Grammaticae.* This is a most elaborate systematic treatise on Latin grammar, which continued thereafter to dominate the subject as an authority, much as Justinian's *Institutes* did Roman Law. It formed the basis of all subsequent treatises on Grammar such as those of Bede, Alcuin, Rabanus Maurus, and following the simple treatise of Donatus (*q.v.*) it was the text generally used. It is far more extensive than Donatus; in fact, is twice as long as Quintilian's *Institutes of Oratory.* It yet exists in about a thousand manuscript copies and is among the most numerous of early printed books. The *Priscianus Major* consists of the first sixteen books on Accidence; the *Priscianus Minor* of the two following books on Syntax. Sometimes, though not often, they appear together. The most important feature of the work is the constant practice of the author of quoting extensively from a wide range of Latin authors to illustrate definition, rule, examples, and exceptions. In all, more than 250 authors are quoted, many of them more than one hundred times. Vergil's *Æneid* is quoted more than 700 times. Among the authors frequently quoted are Aristophanes, Aristotle, Cæsar, Cato, Cicero, Demosthenes, Herodotus, Homer, Horace, Juvenal, Lucretius, Ovid, Sallust, Terence, and Vergil. It is from this source that the Middle Ages derived much of its knowledge of the classical authors. Priscian also wrote *De Nomine, Pronomine, et Verbo*, an abbreviated form of the Grammar. In *Partitiones XII Versuum Æneidos Principalium* he sketches a grammar lesson on the first twelve lines of the *Æneid.*

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PRISON. — See Penology, Educational Aspect of.

PRITCHETT COLLEGE, GLASGOW, MO. — A degree-granting institution, founded in 1866 and chartered as a college in 1897. The faculty of nine members includes four instructors of music and art. A preparatory department is also conducted.

PRIVAT DOCENT. — See DOCENT.

PRIVATE INSTRUCTION. — See ADULT EDUCATION; CORRESPONDENCE SCHOOLS; HOME STUDY; SELF-CULTURE.

PRIVATE vs. PUBLIC EDUCATION. — See PAROCHIAL SCHOOL SYSTEM; PRIVATE SCHOOLS; PUBLIC SCHOOLS; FREE SCHOOLS; FEES; and STATE AND COMMUNITY.

PRIVATE SCHOOLS. — **History.** — The question as to the relative value of public and private education goes back to antiquity. In the *Oratorical Institutes*, Quintilian informs us that the most eminent states had settled the matter in favor of sending the pupil, ordinarily, to the school in which there was a large number of pupils under public teachers. The main objection to the public school was held to be the corruption of morals by the bringing together of a number of children. Quintilian answers that schools are no more immoral than homes. It will be seen, therefore, that with him the argument is with regard to the relative value of public education and domestic education, not that of schools under public direction of the State and of publicly appointed governors, or managers, and the school instituted and maintained by private enterprise. In the latter sense of the term the private school can hardly be said to have been a noticeable institution till the time of the Reformation, since throughout the medieval ages, the instruction was either strictly ecclesiastical, under the direction of the Church, or strictly tutorial and domestic. The Abcdarian (*q.v.*) or petty school, however, is probably of similar antiquity. But the private school of a somewhat higher grade, which afterwards was of sufficient importance to invite the supervision of the Church, may be said to have begun at the Reformation period when the children of two or more families joined together to engage the services of one tutor. The most outstanding instance of the private school at the time of the Reformation was the *Schola Privata* of Philip Melanchthon, which he held in his own house. Students came with insufficient preparation for the University work at Wittenberg, about the year 1524, and to meet this need Melanchthon started a preparatory boarding school. He engaged teachers to assist him, and the school, though not large, was renowned and became the model for further schools — ordinarily public schools — in Germany.

The introduction of the Protestant form of faith in the public schools led to the withdrawal of children of Catholic parents from public schools and the employment of tutors who taught privately. In England in 1580 the Lords of the Privy Council issued letters to the Archbishop of Canterbury requiring him to look into the religion of all schoolmasters, and in the same year the Archbishop made inquisition into the dioceses, inquiring for every parish the names of schoolmasters who taught "publicly or privately within any man's house within your parish," and "if any such schoolmaster is reported, known, or suspected to be backward in the religion now established by the laws of the realm" or any way "secret hinderers thereof." "Private" schools of Catholics, on account of religion, were thus suppressed. This policy was further emphasized by the necessity of the possession by the schoolmaster of the bishop's license. A necessary part of such license was the undertaking to attend church with his scholars and to teach them Dean Nowell's Catechism. (See TEACHERS, LICENSING OF; CHURCH ATTENDANCE OF SCHOLARS.)

There are indications that the subscription to the recognized position of the Elizabethan Church affected the question of the establishment of private schools with Puritans as well as with Catholics. Thus Eusebius Pagit, a "lame, quiet, learned" man, was forced to leave his living in 1592, and established a private school in London. "I taught a few children that I might get a little bread for me and mine to eat." In Oxford there are notices of the well-known private school of Edward Sylvester, c. 1620. William Chillingworth is stated to have probably received his education at Sylvester's school which was in All Saints parish. So, too, were Francis Cheynell and Thomas Willis, the most famous physician of the age. Another famous pupil was John Wilkins. Sylvester was a noted Grecian and acted as the interpreter to Metrophanes Critopylus, a Greek, when he came over to Oxford to be instructed in the doctrines and disciplines of the Church. Thomas Ingmethorp, rector of Great Stainton in Durham, was a private schoolmaster, eminent for his knowledge of Hebrew "and for his admirable methods in pedagogy." He held school in his private house, where he taught twelve or fourteen boys. He translated the catechism into Hebrew. But the most famous private grammar schools were undoubtedly those of John Milton (*q.v.*), 1639–1646, "that wonder-working Academy," and that of Thomas Farnaby (*q.v.*) in London, c. 1630. Farnaby was one of the most honored classicists of his time in Europe.

In Queen Elizabeth's reign separate schools sprang up for the teaching of arithmetic and writing. These were all private schools. In 1562 appeared Humphrey Baker's *Wellspring of Sciences* (an Arithmetic) and this contains at the end of the treatise the first known prospectus of a private school in England Gentlemen are invited to send "their children or servants" for instruction in arithmetic and similar arts, to Humphrey Baker, "for a reasonable consideration," and arrangements are announced for children boarding with him. Possibly Hugh Oldcastle may have had such a private school yet earlier (viz. in 1543) for the teaching of bookkeeping. John Mellis had such a school in 1607, Henry Lyte in 1619, John Speidell in 1628, Robert Hartwell in 1636. In 1650 John Kersey's mathematical private school was well known. Charles Hoole tells us in 1660, in his *New Discovery of the Old Art of Teaching School* (and it must be remembered his was a "private grammar school"), that he had sent his boys for the last twelve years, after his own school hours, to Mr. James Hodder to learn writing and arithmetic. Another such private schoolmaster for writing and arithmetic was Noah Bridges. He says in 1653, dating from Putney, that in his school he taught writing and arithmetic, merchants' accounts, geometry, trigonometry, algebra, and also the Greek and Latin tongues. It may therefore be safely said that in Bridges' school there was a more comprehensive curriculum than in any public grammar school. The private school, therefore, inaugurated the teaching of the modern subjects, and, after the Commonwealth, led to the teaching of English as a recognized subject, even to the detriment of the classical languages. Still, there were private schools which followed, on the whole, the subjects and methods of the grammar schools.

The ejection of the ministers of religion under the Act of Uniformity, 1662, greatly intensified the development of private schools. In many of these cases the direct sources are seen of the establishment of the important Dissenters' Academies (*q.v.*). They began as private schools in which both secular and religious subjects were studied. They took in pupils of very different ages. They were, for instance, the training ground of the next generation of dissenting ministers. The transition to the constitution and organization of the more or less public institutions of Dissenters' Academies was thus simple.

The history of private tutors is a branch of educational history as yet unwritten. But one of the origins of the private school is to be seen in a remark, in the biography of the Elizabethan Archbishop Parker, in a description of whose early education it is remarked, "It was usual in England at this time for the sons of the better classes to have private tutors, a class of boy friends being sometimes formed." This movement must have been in progress in the first half of the sixteenth century, for Erasmus and Vives, and other Renaissance writers, advocate for the royal and noble pupils that the tutor should have other children joined for joint instruction, as indeed was the practice, for instance, of Vittorino da Feltre.

It is difficult to trace the history of the girls' private school. (See WOMAN, HIGHER EDUCATION OF.) But there can be little doubt that its development is substantially the same as for the boys, viz. that it is an extension of the work of the private tutor or governess by the addition of further pupils from a second or third family. It is quite clear that there was a private school for young girls in Antwerp conducted by men. The well-known practice of the employment of a man as tutor in a family to noble girls led, in this case, to the conduct of a girls' school by men. (See the writer's *Vives and the Renascence Education of Women*, p. xv.) In Strype's *Life of Whitgift*, Vol. III, p. 383, there is a protest against girls being taught within the precincts of the church, "especially seeing they may have instruction by women in the town." One of the earliest examples of a fully organized private school for girls is that kept by Mrs. Perwick in Hackney in 1643 — where as many as 800 girls had been educated. That there were other well-known private schools at Hackney, one of which was kept by Mrs. Salmon, 1647–1654, and at Chelsea is clear from Pepys and others. In 1648 there was a girls' private boarding school at Manchester kept by a Mrs. Amye. The most famous of these private schools for girls was that of Mrs. Bathsua Makin (*q.v.*), who had been the governess to the daughter of King Charles I. A little later Hannah Woolley kept a private school and wrote *The Gentleman's Companion*, 1675. (See also ASTELL, MARY.)

A quickening influence in the growth of the private school is to be traced in the establishment of private schools for the teaching of modern languages (a subject altogether neglected in the public schools). The earliest of these was that of Pierre du Ploiche, who wrote a textbook for French in 1553. Claude Holyband (*q.v.*), who taught French and Italian, was teaching in London by 1566 and established a most important private school. About 1580 John Florio (*q.v.*) was teaching privately in Oxford. For a full account of these modern language private teachers, see the present writer's *Religious Refugees and English Education* (in the Huguenot Society's *Proceedings*, 1911). It should be noted that in 1592 G. N. de la Mothe was already teaching privately girl pupils, and foreign teachers soon afterwards begin to be named as teaching in ladies' private schools. After the Restoration in 1660, private schools began to multiply so as to supply an education in which the basis should be the English language and modern subjects. This change may be marked by the publication of books like that of Brightland's *Grammar of the English tongue . . . making a complete system of English education for the use of schools of Great Britain and Ireland* in 1712. The growth of private schools and academies both for young gentlemen and for ladies in the eighteenth century was remarkable. Some of these private schools have important histories, *e.g.* Cheam School in Surrey. Founded in 1666, when a master brought his scholars away from London to avoid the Great Plague, the school was at first carried on in the church belfry. The schoolmaster then took a house, and settled his school in the town. This school was taken over by a Huguenot refugee, a Mr. Sanxay, and remained in the family till it was purchased by William Gilpin (*q.v.*), the well-known lover of and writer on British scenery. Another famous proprietor was Dr. Mayo (*q.v.*), who made the school the center of the Pestalozzian influence in England.

The College of Preceptors (founded 1846) in Bloomsbury Square, London, was founded almost entirely by English private schoolmasters, and has played a significant part in the development of educational movements in England. The Association of Private Schoolmasters of Great Britain was founded in 1884. It aims to safeguard the interests of private schools and to secure their efficiency. At present the Association is concerned to check the establishment of new schools or the compulsory purchase of private schools through competition by the local authorities acting under the act of 1902 to establish secondary schools. Since 1902 many private schools have in this way been converted into public schools or have been put out of existence altogether.

F. W.

Characteristics of Private Schools. — A working definition of the words private school would be generally given and generally accepted in some such form as this: That while public schools are supported and controlled by the state government, private schools are self-supported and free of government control. As a corollary they are not open to all comers, but tend to be schools attended by a group or class. More is made in them of questions of personality and of special aim.

The self-support characteristic of private schools may take either one of two forms. A private school may be a commercial venture supported by direct payments to the manager or " owner," or it may be supported by subscription or endowment, so that the element of profit is more or less eliminated. The first form has comprehended, perhaps, the larger part of the private school group. Its characteristics are of course well known, and the sentiment of Socrates against it generally prevails. Commercial processes introduce self-advertising, often cunningly concealed but often very blatant; commercial attitudes of bargain and dicker encourage mutual hostilities and the taking of advantages on both sides. These things are unwholesome between teacher and taught. Moreover, commercial patronage is hardly the attitude for a true seeker of instruction. Yet these dangers are in practice not so great as they seem. In the first place, there are saving and antiseptic influences in the occupation itself which meet and repel these infections. Just as, in the modern world, the publication of books and newspapers, or the production of art and music is left solely to the support and judgment of the market, so churches, museums, schools, theaters may and do appeal to private patronage without ruinous results. And there are also many counteracting advantages in this form of organization. Private venture schools are always very close to the true demand of the public; what people want, they know. They tend, moreover, to collect about interesting and effective personalities. Private schools get more than their share of good as well as of bad teachers. The relation between teacher and taught, being a matter of free choice and not controlled by a system of appointment, tends to be personal and endearing. Probably the most permanent service of private schools, since they are thus flexible, lies in their utility as experimental schools (*q.v.*). Their experiences serve as models or warnings to the community. Among what may be called the " marginal activities " of the school organization, private effort will always play a valued part; for no step to advance in education has ever been taken without the leadership of private schools. They are not only the home of lost causes and impossible loyalties; they work in advance of the main body. (See DEFECTIVES, SCHOOLS FOR; KINDERGARTEN; COMMERCIAL SCHOOLS; AGRICULTURAL EDUCATION; INDUSTRIAL EDUCATION; BOARDING SCHOOLS; DEUTSCHE LANDERZIEHUNGSHEIME; ÉCOLE DES ROCHES; EXPERIMENTAL SCHOOLS; etc.)

But though at present all lists of private schools are dominated by private venture, yet the endowed schools seem to be increasing and are perhaps destined to play a leading rôle among private schools in the future. They are more permanent than private venture schools, they have longer and riper tradition, they have generally more capital and resources, and they harmonize with the modern tendencies, to combination and to large enterprises. The endowed private school may be a stately institution, indistinguishable in structure and character from a large public school. It may have a long-descended pedigree; it may represent a religious tradition, or a much loved social tradition; it may have an honorable history of educational attainment. It is by its permanence emancipated from dangerous commercial traits, while on the other hand it is free to follow, without confusion or control, its special task or special aim. (See ENDOWMENTS.) Like a voluntary religious organization, such schools " enjoy the immense advantages of freedom of association, of personal initiative, of individual growth." They are important beyond their number. (See PUBLIC SCHOOLS.)

Private Elementary Schools. — Self-support, personal freedom, and personal care, flexibility of organization, and prompt adjustments being the virtues of the private school, it will soon appear that the private school counts much more in some parts of the educational field than in others. It is not too much to say that in all elementary education, in comparison with the public school, the argument for the private school amounts to very little, and the tendency of modern educational evolution is all against it. In the *Report* of the United States Commissioner of Education for 1910 it is stated 93 per cent of all children attending school in the United States are attending elementary schools, and that 92.6 per cent of them are in public schools. The same observation might be made of Germany or France. To find any considerable amount of private elementary work one must look to the more or less tolerated religious schools. But even in countries where this kind of school (see PAROCHIAL SCHOOL SYSTEM) exists, as a significant part of the public system of elementary education, it is more and more coming under government control. This is the only important type of private elementary school.

Other motives for private elementary work produce little result. One motive may be found in the philanthropic schools, especially of large cities, corporate or private ventures, dealing with children unable, through poverty or other defect, to reach the public schools. Another, less significant, is found in private experimental schools (*q.v.*) engaged in trying new methods of elementary work. The private kindergartens still hold a large mass of work. Of course there are many more absentees from the public schools than this accounts for. A certain number of children are supposed to be picking up their elementary education in family conditions, or with tutors or governesses, or in " dame schools." Some of these children, chiefly of the rich and well-to-do, staying out of school, are getting a bad elementary education for want of system. Again, a large number of children in some places are losing their elementary education by going to work prematurely. But, allowing for all this absence, it remains true that nearly the whole of modern elementary education belongs to public schools and is conducted by them, so definitely do the two things, public school and elementary education, belong together.

Private Secondary Schools. — Far different is the case with the secondary schools. A brief survey of the field of education will show that this is the special home of the private school. Among private schools originated every form of what is now known as high-school work in America. A large fraction of it is still done by them, probably from a fifth to a quarter. Nearly the whole of secondary education in England up to 1902 was of the private school type. Even in Germany and France, the secondary schools, though under strict government control, are class schools, receiving fees, and belonging to the *bourgeoisie* in type.

In Denmark and Norway, in Sweden and Finland the private schools are of special importance and influence, more particularly as regards secondary education. In all these countries the state leaving examination which is passed at or about the age of eighteen, is the only portal to the university. Candidates are prepared for it either (1) in state schools, in municipal schools, and in recognized private schools, or (2) in schools which have not gained or perhaps have not sought recognition, in private courses, and by private tuition. In the latter cases they are called privatists, and are subjected to a somewhat severer test.

These two leaving examinations are the medium by which the recognition of private schools is effected. If, in buildings and equipment, in curriculum, efficiency of staff, and salaries, a school reach a satisfactory standard, it is allowed to hold the leaving examination within its walls, just like a state school, and its masters, in the presence and under the guidance of a government-appointed censor from outside, conduct the *viva voce* part of the examination (a specially interesting and important feature in all these countries), whereas privatists have their examinations, both written and oral, conducted by an examination board who are strangers to the candidates. Such private recognized schools are regarded as helping to make up the national provision of secondary education; their statistics are found alongside those of the state schools; masters or mistresses from the one kind of school easily pass into service of the other — from the private school to the public or (less frequently) from the public to the private, — and not unfrequently a teacher may be found engaged in both kinds of schools at the same time. Teachers from a public school are as often as not found acting as government censors at the examinations in a private school; and just as often teachers at a private school act as government censors at a public school. Thus the two kinds of school are perpetually acting and reacting on one another, to the good of both; each tends to impart to the other its characteristic virtues and excellences; and the two, by varying methods, work harmoniously and effectively towards the same goal — are, indeed, so far as it is desirable, welded into one. (See DENMARK; FINLAND; NORWAY; SWEDEN.)

Even if in time more of our American work goes to the public high schools, still there are some legitimate demands for variety in secondary school life which various forms of private school must always be called upon to satisfy. Some things the public high schools would not do, if they could, or could not, if they would. Some of these demands will necessarily create private schools. And at any rate, looking at the matter from another angle, as long as there are private schools, for any reason, the larger part, the stronger part, and the best part of them will be secondary schools. (See HIGH SCHOOLS IN THE UNITED STATES.)

Vocational Schools. — The needs of the adolescent are various to infinity. The possibilities of secondary work are therefore legion. They may be roughly classed as vital, *i.e.* concerned with the development of personality, or vocational, *i.e.* concerned with the conservation of that personality to its life work. Of these, to the children, the most conscious, the most imperative, the most educating are the vocational preoccupations. But these have been, however, for several generations in our public schools strangely misunderstood, misappreciated, and neglected. Children have been obliged to seek their vocational training in America out of school. The effect is naturally the well-known early departure of American children from schools of the state. Only 5 per cent of the school population is reported to the Commissioner in 1909–1910, as attending public high schools.

Now private vocational schools not so reported have made up for a large amount of this neglected work. For example, the " business colleges " and schools have accomplished much good vocational work. (See COMMERCIAL EDUCATION.) Generally they have been private ventures, originating spontaneously out of the pressing need. Most of these are still of this sort. But there are beginning to be private endowed schools which promise still more in the future. And the college and university courses of this sort must soon be reckoned with. Other occupations are represented in the community by private schools. The schools of music and other arts, whose names fill up the educational directories of our cities, are mainly such (see ART SCHOOLS; MUSIC SCHOOLS). They originate in the demands of the locality and are private ventures, though there are some private endowments, and some are affiliated with colleges and schools with endowments not under government control. They are exceedingly numerous and well attended. Handicrafts are taught in this way in an increasing number of schools, *e.g.* schools of telegraphy, dressmaking, cooking, pharmacy, and schools with a more comprehensive sweep like " mothercraft " and " philanthropy." There are advanced schools, under private management, but growing in publicity. We find the vocational trade schools and manual training schools of a general type, originating in private endowment and charging fees, but of great public power and value. We find great schools connected with special industries (see INDUSTRIAL EDUCATION). We find trade schools connected with churches. The whole field of secondary training is filled with vocational private schools, setting an example to the public schools, nowadays gravitating themselves toward the public school system, but to be reckoned distinctly as part of the creditable result of the American individuality in education which would be seriously missed, if lost in the future, and which is embodied in private schools.

Among the vocational occupations of secondary schools is preparation of candidates for entrance not directly into the markets of life but into higher institutions of learning. In this class one might reckon candidates for government service and other occupations protected by examination or certification. No public school system can cover this ground completely. Army, navy, civil service, professional and technical schools, scientific work, have so many varying needs as to create a large body to give private preparation. Special dexterities imply special schooling. Hence the need here of private schools. (See INDUSTRIAL EDUCATION.)

Preparation for College. — A most significant group of schools in America, called " preparatory schools," or " fitting schools," has originated in the need of previous preparation for the college and universities, until recently themselves private schools. These schools have many special intellectual and social ideals; but their work, though actually, for historical reasons, rather specially linguistic and theoretical, has been accepted as representing several essential requirements for secondary culture. They have thus enjoyed a great prestige; and have been used to determine the course of public as well as private secondary education. They have been discussed and standardized by committees and other bodies appointed for this purpose, and doubtless exercise a great and wholesome influence over American education.

The participation of the public high schools developed in the last fifty years in the work of the preparatory or fitting schools of America has been of great service to education, in the standardization of college requirements, and in the move for uniformity as against the somewhat capricious and confused diversity of different college demands. Private and public schools have worked side by side, and the massive power of the public school has made itself felt. In the immediate future public schools may be even more useful in a similar way; speaking in the name of the general public, they can assure the colleges and universities, as private schools cannot, that they may now safely admit to their work, without too much distinction among subjects prepared in school, any person of suitable intellectual stature and competency. But great as are the hopes for the public school, nevertheless, as far as special preparation demanded by higher institutions is concerned, this will probably in the end remain a factor most stimulating to the creation of appropriate private schools, as it is now a leading interest among them. (See COLLEGE REQUIREMENTS FOR ADMISSION.)

Another form of usefulness of the preparatory schools has been collateral among the groups of secondary schools in general. Not only is their work in their own task a significant part of the sum total of secondary education; but they have also influenced the theory and practice of all other secondary schools about them. This influence counts among the services of private schools to the country. Even where the public high schools have outdone their models, the private schools have after all many times set the fashion.

Military Schools. — Another special form of training deserves mention by itself, among the activities of private schools. In Europe the educational effects of universal military service have often been favorably commented upon. Even where, however, this service is universal and compulsory, there are special schools for vocational training of officers. In England, with certain brilliant exceptions, this work is left to volunteer effort. In America we have always had West Point, and Annapolis, our only special schools, to look up to for models and leadership. But, with some exceptions in the matter of drill and organization, the private schools in this country have taken over this matter entirely. The military schools of this country are private schools. Like all private schools they vary in efficiency; but the best of them show the great effects of a vocational ideal of a high code pursued with devotion. It is maintained in a recent article (*Military Service Institution Journal*, May, 1912) that the military situation in the United States is distinctly benefited by these military schools. Whether this belief be justified or not, the effects on the schools and pupils of this training are justly valued. The only criticism offered against them has been their tendency, owing to the superior efficiency of their moral training, to collect difficult cases in them, a criticism which has been made also of boarding schools, small colleges, and all private schools. (See MILITARY EDUCATION.)

Denominational Schools. — The forms of private school hitherto considered contemplate school chiefly as preparation for life. This ideal, however, does not contain the whole case. There must be motives for the creation of schools in which vocational preparation plays a less prominent part. School years are branches of the Tree of Life not less than of the Tree of Knowledge, and in their ethical and spiritual experiences ideals of great influence and worth must be reflected. There is, for example, the religious life, very hard to provide for in governmental schools. Governments can in modern times recognize no religious body above another; the religious experience must be left to church and home. Here is a most powerful and apparently most permanent argument for the creation of private schools. All religious bodies feel this impulse. Of the private high schools dealt with in the *Report* of the Commissioners of Education, two thirds are conducted by religious bodies. A large part of the colleges and universities in the United States are either under direct control of some religious body or in close affiliation with it. The Catholic Education Association, for example, has on its roll 67 colleges, 16 seminaries, 980 schools. The Protestant denominations are not backward. There are even schools intended not merely to be nonsectarian but carefully to diminish religion as life experience. All this is necessarily private school work. Modern government schools must apparently be secular.

Social Selection. — But there are other life experiences than religion which governmental schools cannot formally recognize except as incidents and by-products of their history. Among them are the experiences, the ideals, the habits associated with family life and the life of social groups. On the basis of social selection there are reared the most famous and perhaps the best of the private schools. The great English schools represent a social class. There are such schools, though closely under government supervision in France and Germany, representing social distinction as well as religion. In America, while we recognize that our ideals, our ethics, even our manners and customs, must in the main be such as to fit us to belong to the great public family of which we are all proud, yet even here there are family groups of a more private character, which seek for separateness and distinction, especially in education. How valuable such things may be is a matter of some dispute. The doctrinaire democrat is apt to denounce such ambitions; the parent face to face with the problem of his son's life is perhaps apt to overvalue exactly such distinctions as are cherished in private schools in some quarters.

The discreet American need not take sides. He will remember the federal constitution and the country's motto. At any rate, in the ebbing tide of family life, especially in the great cities, artificial family experiences seem now called for in school life; in many situations, public schools may and do efficiently perform this function, yet there are situations, unsolvable by schools open to all comers, which must be met by schools of private effort. Many schools, even in America, must exist which intend no more and profess nothing else than social and domestic privacy. These schools are not necessarily objectionable or of no service to the state. "We begin," says Burke, "our public affections in our families." We certainly may begin them in such a private and secluded school, which is after all full of corporate spirit. There is no evidence that the academies of the eighteenth century, or the boarding schools, or private day schools of our own time have not produced their share of public servants. (See Boarding Schools; Academies; Family Education.)

The scouting parties and forlorn hopes in the warfare of the Liberation of Humanity belong to private schools. It should be remembered that there is an ambiguity in the phrase "public service"; it connotes both what is done for the public and what is done by it. The main question about any educational institution therefore is not who pays for it but what it is worth to the common good. "Modern states," says the Commissioner, "shall certainly see to it that any citizen of any age who seeks instruction in any subject shall find instruction provided for him, not necessarily at the public expense, but made actually available for him by ways that are in his reach." In aiding citizens to forms of education not yet or not at all within reach of the public school, the private school has its permanent meaning. J. G. C. and J. S. T.

See ABCdarians; Dame Schools; Petty Schools; Public Schools; College, English; Boarding Schools; Deutsche Landerziehungsheime, École des Roches; Experimental Schools, etc.

See also Grammar School; Public Schools (English).

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PRIZES. — See Punishments and Rewards.

PROBABILITY. — See Statistical Method.

PROBABILITY, THEORY OF. — If the exact conditions which govern a given event cannot be known or subjected to computation, we may nevertheless often ascertain the frequency with which it is likely to occur, or, in other words, its probability. We commonly designate the degree of this probability roughly by distinguishing between the impossible, the possible, the probable, the very likely, and the certain. However, more definite statements of amount of probability are made possible by the use of quantitative methods. There are two methods of calculating probability. The one reasons *a priori* or from a consideration of the very nature of the case, the likelihood of which we are computing. The other is empirical, and bases its results on an actual count of the frequency with which these cases occur.

(1) The simplest cases for an *a priori* calculation of probability are afforded by games of chance. In the tossing of a coin, for example, it would seem that the chances are even that it will fall heads. In stating the degree of probability of such cases a fraction is used, of which the total number of possible alternatives constitutes the denominator. The number of these alternatives which represent instances of the case the probability of which we are stating furnishes the numerator. Thus the chances of a throw of heads is said to be one half. The chances that the throw of a die will give, for example, a four are one sixth. If two dice are used, the chances of throwing a four are two sixths, or one third. The chances of throwing two fours are one thirty-sixth; for thirty-six combinations of the numbers on the dice are possible, and only one of these combinations is double four.

It is evident that this sort of a determination of probability is possible only where from the nature of the case the number of alternatives can definitely be known, and where the likelihood of each is presumed to be approximately equal. The combination of conditions that actually determines the appearance of any given alternative is of course such as to make it necessary. But the conditions are so numerous and so variable as to render any particular combination just as likely as any other. *Per contra*, if a given alternative persists in occurring more frequently than its inherent probability would seem to indicate, one might suspect that the combination of conditions that produces it is for some hidden reason more likely than any other. For example, if four is thrown on an average not once in six throws but once in three, there is good reason to suspect that the die is loaded.

It is to be noted that the chances that a given case will appear will not increase because it has in a number of trials not appeared; nor will they decrease because the case has appeared once or many times. If on thirty-five attempts one has failed to throw double six, it is no more likely to come on the thirty-sixth throw than it was on the first one. Similarly, if one has just thrown double six, he is no less likely to get it on the next throw than on any other.

(2) The empirical determination of the degree of probability consists in gathering data as to the actual frequency of a given case. It is, therefore, a matter of statistics. Indeed, the predictive force of statistical calculations rests essentially upon the theory of probability. (See STATISTICAL METHODS.) A reliable average fact can be ascertained only by gathering many cases and finding the average deviation or the probable error. The chances are even that any future measure will not differ from the average by more than the probable error. By studying the curve of distribution (see GRAPHIC CURVE) one could ascertain the degree of likelihood of any measure. He could determine the measures within which any fraction of the cases would lie. As the number of cases from which the degree of probability of the occurrence of a certain instance is computed increases, the closeness with which this calculated degree of probability approximates to the correct one grows greater. If one found one black sheep in twenty and two in 100, it might be inferred that one fiftieth is nearer the true probability of the occurrence of a black sheep than is one twentieth. When the number of cases gets into the hundred thousands, the estimated probability cannot possibly vary more than a slight amount from the true probability. When the number of cases is not so great, reliability in the calculation of probability is much increased by taking these cases from as great a variety of conditions as is possible. Our data thus constitute a better example of a very large number of cases. If one wished to calculate the percentage of pupils that are eliminated from our schools yearly, and could not get complete records, he should gather the data he uses from as great a variety of places and school conditions as possible.

It is evident that in a field where the conditions are so complicated as they are in education, nearly all conclusions must be treated from the point of view of the theory of probability. Educational methods are often attacked because they sometimes fail. Standards are discredited because they prove unreliable in special cases. It is certain, however, that we possess little or nothing in the way of methods of teaching, standards for determining fitness either in teachers or pupils, devices of administration, etc., which can be infallibly relied on to yield only desirable results. It follows that excellence is a relative matter, and we must choose that alternative, the probability of the success of which is greatest. A realization of this fact would free the work of the school from much sincere but ill-grounded criticism. E. N. H.

See GRAPHIC CURVE; STATISTICAL METHODS.

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PROBATION, PROBEJAHR. — A probationary year was introduced as part of the preliminary preparation of secondary schools in Prussia in 1826 and has been continued ever since. After passing the state examination candidates for the higher teaching profession are assigned to a seminar attached to a secondary school for a year for their theoretical training. This is followed by the probationary year of practice work. The candidates are assigned to their schools by the Provincial School Board and are placed under the director, who must arrange for them to teach in different grades and in several subjects. Both the director and specially assigned teachers must supervise the work of probationers. At the end of the year the candidates must make a written report of their year's experience to the directors. Where probationers have proved themselves in any way incompetent, the Provincial School Board has power to extend the period of probation. On the satisfactory completion of the year of probation, candidates are certificated and are eligible for appointment. For elementary teachers there is in Prussia a period of probation extending from two to five years, and teachers are not definitely appointed until they have passed a second examination, which may be taken not less than two nor more than five years after the first examination. (See GERMANY, EDUCATION IN.)

In France tutors in the *lycées* who have not the master's degree are appointed on probation for a year. They receive their appointment from the Rector, and, if satisfactory, are appointed by the Minister. In the elementary schools teachers are appointed on probation as *stagiaires* for two years, at the end of which they may take the examination for the *certificat d'aptitude pédagogique*, and receive permanent appointment as *titulaires*. (See FRANCE, EDUCATION IN.)

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PROBATION OFFICERS. — See ATTENDANCE, COMPULSORY.

PROBLEM. — Every conscious situation involving reflection presents a distinction between certain given conditions and something to be done with them; the possibility of a change. This contrast and connection of the given and the possible confers a certain problematic, uncertain aspect, upon those situations that evoke thought. There is an element, which may be slight or which may be intense, of perplexity, of difficulty, of confusion. The need of clearing up confusion, of straightening out an ambiguity, of overcoming an obstacle, of covering the gap between things as they are and as they may be when transformed, is, in germ, a problem. It does not follow, however, that this problematic aspect must be consciously recognized as a problem; it may operate without its being formulated so as to direct the course of thinking and endeavor. (See METHOD.)

The primary position of problems with reference to stimulating and guiding thought — the problem fixing the beginning of reflective inquiry and a solution its end — accounts for the prominent place occupied by the asking of questions and setting of problems in educational practice. There are, however, two common and allied errors regarding the nature of the problem. When it is overlooked that the problematic factor may be implicit in the situation, rather than existing as a separate factor, the necessity of a natural inclusive situation of experience will be ignored; it will be assumed that the mere asking of a question in words, or the setting of a task, constitutes a problem. But in reality, all that the question as formulated in language can do is to *suggest* some difficulty arising within the pupil's own experience. It cannot create the problem, nor can it even serve to remind the pupil of a genuine problem unless especial pains are taken to use it simply as a stimulus to focus some problem occurring quite independently. This suggests the second error: supposing that what is a genuine problem for one person, such as the teacher, is necessarily a problem or the same problem for another. As matter of fact, the conditions in experience, the context, determine whether a matter is or is not a problem and what sort of a problem it is. J. D.

PROBLEM. — In Mathematics. — The word "problem" is rather loosely used in mathematics. A problem is really a question proposed for solution, from the Greek πρόβλημα, which has this meaning. The roots of the word are πρό (before) and βάλλειν (throw), so that a problem was something put forward for discussion or solution. In geometry the problem is distinguished from the theorem as being a proposition requiring some construction to be effected, while the theorem required some assertion to be proved. It is evident that the distinction is not scientifically very significant, for the statement "An equilateral triangle can be constructed" is a theorem, while "To construct an equilateral triangle" is a problem, although the mathematics of each would be essentially the same. In algebra and arithmetic certain writers have used the word "example" to cover all problems to be solved, and some have used "problem" to refer only to concrete exercises, or, as the Germans call them, "clothed problems."

The educational interest attaching to the word relates chiefly to the nature of the concrete (clothed, applied) problem, and to the balance to be maintained between this type of proposition and the abstract (naked, pure) problem. In connection with the former there is ever a controversy over the inherited problem that has ceased to have, if it ever had, any immediate application to current conditions, and the modern problem of the artisan of the present time. Problems of this latter type have been called "real problems," — an unfortunate nomenclature, since "real" is chronologically and geographically a relative term. What is real in one place or at one time may be very unreal in another place or at a later period. The term is not, however, of so much consequence as the idea connoted, and this idea is one to be considered.

The applied problem in the mathematics of the elementary and secondary school relates chiefly to arithmetic or algebra, including the work in simple mensuration. The questions of special significance relate to their origin, their development, their value, and their present status.

The earliest problems of the race were those relating to common life, — the increase of flocks, the records of granaries, and, much later, the exchange of money. Many problems of this kind are recorded on the cylinders of Babylon, and a few appear in the remains of early Egypt. Their use in the childhood of the race suggests their use in the childhood of the individual, and teachers recognize this fact by making all of the early applied problems of arithmetic relate to the child's immediate interests. With the development of a leisure class, and notably the priesthood, another type of problem appeared, one that partook more of the nature of a puzzle, although generally clothed in language that was at least related to the affairs of life. As time went on these problems became more numerous, and finally they led to a higher mathematics, the mathematics of the philosopher of the early days of culture. They are found in all countries and in all historic periods; they formed part of the medieval training in mathematics, and in the same way they enter into algebra to-day; they were looked upon as wit sharpeners for thousands of years, and probably with some justification; and they form a considerable part of the inherited problem material that is found in the schools at present. The attempt to justify this puzzle type is not by any means modern; it is found in various epochs, the question of the value of the puzzle having been raised from generation to generation from time immemorial. The Hebrew writers sought at times to correlate the puzzle with religion, as in the story the Talmudic writers tell of Rabbi Huna. While Rabbi Huna ate one portion, Rabbi Pappa ate four, but when Rabbi Huna dined with Rabina, he finished one portion while Rabina finished eight. Then said Rabbi Huna, "I had rather eat with a hundred Pappas than with one Rabina." The problem is to justify the remark of Rabbi Huna. The Christian writers also sought to justify useless computations by reference to the Bible, as when Wentsel (1599) demanded of his pupils that they should find the number of minutes from the creation of the world (3967 B.C., as he gave it) to the year 1598. Moralists sought to be relieved of the odium of apparently useless computation by introducing problems about the pernicious effects of vice, as in Johann Albert's work of 1534: "Item | Wenn einer alle tag 2d in gebrandten Wein verzecht | Wie viel hat er verzecht im jar lang?" This movement reached its zenith in Schmidt's *Biblischer Mathematicus* (1736). The early arithmeticians of the Renaissance recognized the difficulty of justifying the presence of the problems of this type in the body of the text, and placed such questions in a special chapter towards the end of the book. Thus Rudolff (1526) has a chapter on *Schimpffrechnung*, a term that Thierfelder (1587) defines in these terms: "Schimpff Rechnung. Was sind Schimpf-Rechnung? FEine | künstliche Fragen damit man die Schuler | vnd andere diser | Kunst Liebhaber | erlustiget | fleyss vn̄ mühe | dise Kunst zu lernen | anzuwenden." In other words, it was clearly recognized that many absurd problems had a value in that they were amusing and therefore were calculated to interest a pupil in computation where a real business problem might fail. Problems of this type, confessedly introduced for the purpose mentioned, are found in many works and in various countries. Thus Trenchant (1566) has a chapter "De diuers ieux & passetems par nombres"; Baker (1568) states that "The 16 chapter treateth of sports and pastime, done by number." Tartaglia (1556) remarks, "Ponamo anchora, per acuir l'ingegno di dilletanti"; and the early Dutch writers have their chapters on "Vermakelijcke Vraghen." By the seventeenth century enough of these puzzle problems had developed to justify Claude-Gaspar Bachet Sieur de Méziriac (1615) to publish the first noteworthy treatise on the subject, after which numerous works on mathematical recreations appeared.

The historical facts above given show that a problem that appears at present as useless may have originally been an excellent "real problem"; that "real" has merely a local and temporary significance; that much that appears as original in problem making is really the working over of old material, clothing it in new phraseology, — a rule that applies to practically all of the problems to be met in current textbooks; and that a type persists if it is interesting, whether it has lost its practical significance or not, constantly supplanting more practical types that have no immediate interest for the learner. It is this question of interest that has kept hundreds of problems, in spite of the dictum of the educator that they ought not to be interesting. The rule of experience has been that a problem remains if it appeals to the learner as interesting, and if it illustrates some process, even though its subject matter has no direct bearing upon present life.

Considering the question now from the point of view of the demands of to-day, there is everywhere in the leading countries of the world an apparent effort to frame problems that shall represent modern conditions and at the same time be generally interesting. The former is much easier than the latter, for if problems involve the technical language of some particular industry, they fail to have interest for those who are not familiar with that special field of activity. Thus shop problems in carpentry have little interest for one who is working in forging, and those in metal work do not seem particularly real to one whose tastes are agricultural. Where a school or a class is closely related to some special industry, the solution is not difficult; but in the general type of public school, where children are being trained for various occupations, the specialized problem is not so satisfactory as the modernized problem of the traditional character. Such a problem should state modern conditions as to customs, prices, and terminology, but it fails of its purpose if it becomes too technical.

In algebra there have been successful efforts made to introduce problems in mensuration and applied arithmetic early in the course, for the purpose of adding interest to the work. Efforts to find commercial or scientific applications of topics like factoring, quadratics, and radicals have not been very successful, and the immediate interest in these subjects must be found in the mathematics involved, in the game element, and in the assurance that the work is a necessary preparation for both pure and applied mathematics. In elementary geometry there are numerous applications that have some semblance to reality and that add a little temporary interest to the subject, especially with beginners. Where a course is given in geometric drawing, below or early in the high school, a little work in the study of Gothic windows and formal patterns may profitably find place. When a pupil once gets into the spirit of the subject, however, the pure science has always been found to be more attractive and to afford the only substantial basis for satisfactory work in either pure or applied geometry.

In trigonometry the range of applied problems is so great as to extend into the fields generally reserved for engineers, astronomers, and students of mechanics. The pupil has now enough maturity so that the supply of problems is practically unlimited. On the other hand, since this subject is generally elective, mathematics is studied for its own sake, and not only are fictitious applications out of place, but even real problems are not so important for the maintaining of the interest as they are in the lower branches. D. E. S.

PROCESS. — With the development of dynamic conceptions of the world, mind, and society, it became necessary to express the idea of a succession of changes in which, in spite of changes, an identity of character is maintained, especially if the series of changes manifests a characteristic unity of result. Process is the term in most general use to designate this idea. In recent educational literature, we find, for example, such phrases as "educative process," "learning process," and "teaching process." In each case there is a complex series of changes tending toward a single, effective result. J. D.

See Activity; Function.

PROCLUS (*c.* 410–485). — The most important of the later Neoplatonists, born at Constantinople and brought up at Xanthus in Lycia. He later moved to Athens, where he became professor of philosophy. His chief work was to systematize the whole *Parmenides*, *Republic*, *Timæus*, and *Cratylus*, and two theological works, Περὶ τῆς κατὰ πλατῶνα θεολογίας (*On Theology according to Plato*), and Στοιχείωσις θεολογική (*Institutes of Theology*), giving an account of Neoplatonism. He was the author of a number of hymns to the Greek deities, of astronomical works (Ὑποτύπωσις τῶν ἀστρονομικῶν ὑποθέσεων, *Outline of Astronomical Hypotheses;* and a paraphrase of Ptolemy's *Tetrabiblus*), and mathematical works (Περὶ σφαίρας, *On the Sphere;* and a commentary on the first book of Euclid). Proclus is also supposed by some authorities to have been the author of a number of grammatical works, including commentaries on Hesiod's *Works and Ways*, scholia on Homer, a treatise on epistolary style, and a grammatical chrestomathy (Χρηστομαθία γραμματική). According to Suidas, he also wrote 'Επιχειρήματα κατὰ χριστιανῶν, or *Animadversions against the Christians*, who opposed Proclus as the strong supporter of pagan religions and as a "hierophant of all the world."

See Neoplatonism.

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PROCTOR. — See Universities.

PROCURATOR. — See Universities.

PRODIGY, MENTAL. — A person, especially a child, who is capable, usually with little or no training, of mental performances out of the ordinary. Such ability usually takes the direction of proficiency in some particular mental direction such as mathematics or music. The mathematical prodigy is able to give the result of what to the ordinary person is necessarily a long series of calculations almost immediately and without much calculation. Some of these mathematical prodigies, *e.g.*, have been known to be able to tell the day of the week of any date in the past and future by simple mental calculations. Musical prodigies begin to play various instruments at early ages and without previous training. Such cases are to be sharply distinguished from the merely precocious child. Frequently this ability in directions other than that in which they show such marked proficiency is not great, and in some cases it is subnormal. The precocious child, however, is apt to be advanced to a greater degree than the normal in general mental capacity. To what extent precocity of this sort is the result of training, to what extent of native endowment, and to what extent it should be encouraged or suppressed are important educational questions. In many cases precocity has been present in children whose training has been out of the ordinary. Investigations such as those of Sully and Galton into the relation between precocity and genius seem to show that the view that precocity is usually connected with later mental weakness or even physical breakdown is incorrect. A large proportion of those who have ranked as geniuses in later life have been precocious in their mental development. Precocity, therefore, is to be apparently welcomed, except in so far as it may militate against bodily development.

E. H. C.

See GENIUS.

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PROFESSIONAL EDUCATION. — A term which includes in its broadest outlines all that education which has direct value as preparation for professional calling or employment in life. It is differentiated on the one hand from the vocational education which relates to those employments of social grade not recognized as professions (see INDUSTRIAL EDUCATION), and on the other hand from the general or so-called " liberal education " which has no specific practical application in view. This later phase of the subject is discussed under the caption LIBERAL EDUCATION. It is often argued that the " liberal education " of the old-time curriculum college was in reality a professional education for the few professions recognized as " liberal," *i.e.* the ministry, medicine, and law. This question is discussed in certain of its aspects in the article on the COLLEGE, AMERICAN. Even in the earlier period, the centuries immediately following the Renaissance, the education that was recognized as liberal was organized for certain classes alone, and in a sense was a professional education for a " gentleman." The entire theoretical or sociological aspect of the subject is discussed under the captions CULTURE, EDUCATION.

During the nineteenth century the scope of the " professions " was broadened by the development of modern sciences and the demand for an education which would prepare for the technical or " professional " careers based on them. Hence the various lines of engineering or technical education must be added to the more restricted " learned professions " of a few generations earlier. This breaking down of the lines of restriction, hedging the older learned professions, has had much to do with broadening the entire conception of education in recent times, for it has been necessary to recognize as liberal any education which would prepare for these lines of social service which demand broad educational preparation. Hence the conception of culture or of liberal learning as the service of learning to social needs has replaced the narrower conception that restricted it to the lines which did not deal directly with material things.

The entire subject of professional education thus falls into a variety of fields treated, each under its proper heading, it being no longer possible to consider it either theoretically or practically as a unified phase to be differentiated from all others, or as merely the application of one type of education to one learned group, as that of the ministry. These various aspects are treated under: LAW, EDUCATION FOR; MEDICAL EDUCATION; TECHNICAL EDUCATION; THEOLOGICAL EDUCATION. Various other special phases of education are also to be included, perhaps as subsidiary to these main groups. Among these are AGRICULTURAL EDUCATION; DENTAL EDUCATION; EDUCATION, ACADEMIC STUDY OF; PHARMACEUTICAL EDUCATION; etc.

PROFESSIONAL ETHICS. — See TEACHING AS A PROFESSION.

PROFESSOR. — The incumbent of a chair, endowed or otherwise established and maintained, in a particular subject in a university or college. The use of the title is of late introduction in the history of universities. In the medieval period the terms Master, Doctor, and Professor were synonymous, but distinctions in their use were gradually made. So at Paris *magister* was used in the faculties of theology, medicine and arts, professor frequently, and doctor rarely. At Bologna the teachers of law affected the title, *doctores*, and sometimes *professores* or *domini*, rarely *magistri*, and this usage was transferred to Paris, where a *doctor* meant as a rule a doctor of canon law. A similar distinction was made at Oxford in the fifteenth century, the title *doctor* being used in the superior faculties, and *magister* in arts and grammar. In Germany and Scotland subjects went in rotation or by lot to the Regent masters until particular subjects began to be restricted to specialist teachers — a development reached in Germany by the governmental endowment of chairs for public lectures, and in Scotland in the eighteenth century through the growing extent and scope of each subject. At Oxford Lady Margaret, mother of Henry VII, in 1497 endowed the first chair, the Margaret Professorship of Divinity. This was followed by the endowment of Regius professorships at each of the Universities of Oxford and Cambridge in divinity, civil law, physic, Hebrew and Greek. It is probable that a further extension of the term to chairs in other faculties resulted from these endowments. There is as a rule but one professorship in each subject at Oxford and Cambridge, and subordinate instructors in subjects in which there is already a professor or in subjects which are not regarded as of sufficient importance for a special chair have the title of readers or lecturers. A similar practice prevails in the newer universities, where there is usually but one professor in each subject, other teachers being called lecturers. The custom in France is much the same.

In Germany and France the title of professor is also given to some teachers in secondary schools and sometimes in normal schools. Such a title is as a rule in Germany merely bestowed by courtesy. In Italy and Spain teachers of elementary schools, both men and women, are called professors. In Great Britain and Ireland the title is invariably restricted to the holders of university chairs, except for its gratuitous use by teachers and performers of popular arts such as juggling, phrenology, boxing, dancing, etc.

Nowhere, perhaps, is the title of professor more loosely used than in the United States, and this abuse has been largely encouraged by numbers of educational institutions which desire to lay claim to a higher status than they deserve. In some parts of the country the title is popularly applied to any man connected with education work of any kind or grade. While the arrogation of the title to elementary and secondary schools is merely a popular usage, it is in many cases officially adopted by normal schools. And it perhaps follows, naturally, from the loose use of the term college or university, that the number of so-called professorships, paying in many cases salaries lower than elementary schools, is increased. Coming to the recognized institutions for higher education the most striking features in nomenclature of the instructing staff are the gradations within the rank of professor. These vary from the simple assistant professor and professor to assistant, adjunct, associate, acting, and regular professor and lecturers with the title of professor. There is a growing tendency to reduce the number of grades and not to make salary dependent on promotion and grade, provided efficient work as a scholar, teacher, or administrator is being done.

See College, American; Cambridge, University of; Oxford, University of; and the sections on Higher Education in France, Education in; Germany, Education in; and Italy, Education in; University.

PROGRAM, DAILY. — See School Management.

PROGRAM MAKING. — See School Management.

PROGRAM OF STUDIES. — The technical term used to designate all the studies offered in a given school to be distinguished from (1) the curriculum, meaning the group of studies systematically arranged for any pupil or group of pupils; and (2) the course of study, meaning the quantity, quality, and method of work in any given subject of instruction. This differentiation of terms was adopted by the Committee on College Entrance Requirements of the National Education Association in 1899.

See College Requirements for Admission; School Management.

PROGRAM, SCHOOL. — See School Management.

PROGRESS. — The conception of progress may perhaps be best defined through comparison with such terms as development, evolution, growth (*q.v.*). Like them it involves the idea of a series of changes which have a cumulative direction, in which the earlier members do not merely surrender their place to the later but have a certain continuity with them, so that all taken together form the history of one character or subject. The idea of progress differs in explicitly connoting change toward a more desirable state of affairs, something higher, better, more perfect. It also suggests, if it does not explicitly affirm, that conscious intention and effort play some part in bringing about the improved condition. Ancient Greek philosophy was familiar with the conception of evolution as applied both to organic life and to the world in general. It lacked, however, the idea of progress. Changes were conceived either as forming an endless cyclical round of passage away from and return to the same state of affairs; or as evidence of a certain falling away from true, or eternal, being, with possibly some attempt to return to the more perfect state from which a lapse had occurred. But this improvement was not progress but recovery of a prior state. Medieval thought was too dominated by the conception of the fall of man, of a recovery or redemption effected through supernatural agencies and involving an ultimate violent destruction of all things, to entertain the conception of progress.

A great part of the permanent significance of Francis Bacon is the clearness and force with which he asserted both the need and the possibility of progress, to be brought about through a scientific knowledge of natural conditions and taking effect in inventions directed toward ameliorating the lot of man. The result was a radical change in the conception of the meaning of wants and of the power of knowledge. Wants in the static philosophy had always been treated as evidence of deficiency and imperfection, mere absence of true being. Now they were increasingly treated as the dynamic, motive forces of progress — a point of view which found a classic expression first in the social philosophy of Adam Smith and then of the utilitarian school. The object of knowledge was no longer taken to be the final cause (*q.v.*), a static perfection, but productive or efficient causes, a knowledge of which would enable prevision of and adaptation to future conditions and, in many cases, deliberate control of the means of reaching ends. The mechanical point of view of modern science is thus partly the offspring, partly the source, of the growing importance of the notion of progress. The philosophy of the eighteenth century enlightenment was animated throughout by conceptions of the prospect of the indefinite prefectibility of man. Conditions that had previously been regarded as inevitable accompaniments of the human lot, political despotism, subjection of masses to intellectual authority, sickness and poverty were regarded as due to man's ignorance and lack of freedom, and as sure to pass away with the growth of science, and with economic and political freedom. While one result was an outbreak of utopias and millennial schemes of all kinds, anarchistic, communistic and socialistic, nevertheless we owe to this movement of the eighteenth century our present almost religious faith in the need of progress and in the possibility of making it the ruling principle of human affairs. The reflex effect of the idea of continual amelioration upon education has been very great. The materials and methods required in a progressive society differ profoundly from those appropriate to a stationary society. Since progress is not automatic but requires trained intelligence and forceful character, progressive societies depend for their very existence upon educational resources. Moreover, the conditions that are favorable to progress are also favorable to the release of energy from the restrictions of customs and convention; and only through education can the forces thus set free be safeguarded against undirected and destructive manifestation. J. D.

PROGYMNASIUM. — The incomplete or six-year classical school of the German States.
See Germany, Education in.

PROMOTION. — See Grading and Promotion.

PROMOTION BY SUBJECT. — A method of promotion devised to avoid the retardation of bright pupils by the mechanical organization of graded schools, especially when promotion is by full classes only at definite periods.
See Grading and Promotion.

PROMOTION OF TEACHERS. — See Teachers, Training of, in Service.

PROMOTIONAL EXAMINATIONS. — A form of test instituted in an attempt to determine the salary of teachers on some other basis than that of length of service, so common in our American cities, and the so-called "classroom efficiency." Such tests, or examinations, are attempts to add to both length of service and classroom efficiency a test of professional growth, as measured by a written or oral examination, or both, or the preparation of a short essay or thesis, on some pedagogical question or book. Such examinations have been instituted in Boston; Paterson, N.J.; Chicago; Kansas City, Missouri; New York City; Lincoln, Nebraska; Saginaw, Michigan; Springfield, Ohio; and Washington, D.C., among larger cities, and also in a number of smaller cities. These examinations are always in addition to the usual service, years, and classroom supervision reports, and commonly include examinations in English, sometimes in other academic subjects, and usually in professional reading, observation, or study. Many superintendents feel that they have rendered valuable service, but the teachers in the cities where these tests have been instituted have generally looked upon them with but little favor, and in some cities they have openly and vigorously opposed them. E. P. C.
See Teachers, Training of, in Service.

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PRONUNCIATION, ENGLISH. — Differences in pronunciation are inevitable; their degree depends upon the degree of separation in time, place, and circumstances of any two speakers. No two persons pronounce exactly alike. When divergencies associate themselves with some locality (provincialisms), or depart from recognized educated usage (vulgarisms), they become unacceptable. Among any group of people where intercourse is constant, a high degree of uniformity will result, and thus a standard of pronunciation will be established. Such a standard, arising among educated people, will be recorded as authoritative.

But English is spoken in too wide a territory for any one center of culture, in present conditions of intercourse, to extend its influence over the whole, and hence there can be no one authoritative standard of pronunciation for all English-speaking people. Even in England, relatively small as the country is, phoneticians find some difficulty in choosing which, of varying values, shall be accepted as the normal vowel in certain words. In the United States New England influence was formerly dominant; but, with the filling up of the Mississippi basin and the Far West, the weight of population and of influence has shifted westward, and standard American English now is rather a usage free from the pronounced peculiarities of any one section.

In England, South English (SEng) usage (with which New England usage in the main agrees) is generally assumed to be the standard. Some differences between SEng and prevailing American (largely also North English) pronunciation are these: (1) A more marked diphthongization in SEng of the long front and back vowels, i: e: o: u: (symbols from the International Phonetic Alphabet);

e.g. *made* = meid, *note* = nout, etc. (2) In SEng, o before r is generally "open" (as in *lord*); *e.g.* *port, glory, more,* etc., become in SEng pɔ: t, glɔ: ri, mɔᵊ or mɔ: , etc., whereas in America, in these and many words like them, a "close" o (as in *note*) is the usual sound. (3) In SEng there is loss of r before a consonant or a pause (common in New England and the South also); *e.g.* hɑ: d, pɔ: t = *hard, port.* Generally in America a neutral ə and often a trace of r appear, as hɑəʳd, poəʳt. (4) *Not, odd, what, water,* represent a large class of words that in SEng have a vowel close to the *au* in *august'*, but the majority of people in America make the sound ɑ, with no difference between *a* and *o* in *father* and *bother*. American dictionaries, however, still assign to the vowel of these words the SEng value. (5) In SEng the vowel of *pass, past, bath, half, aunt, grant, chance,* etc., is ɑ as in *father*. In America the usual sound is æ as in *bad;* in New England ɑ is heard, but not universally. Some speakers in both countries, wishing to avoid both ɑ and æ, sound the words with an intermediate vowel, near that of French *patte*, but long. This pronunciation, though distinctly artificial in origin, and not widespread, is supported by American dictionaries. (6) In SEng, *bare, air, there,* etc., have a very open e, a sound between the vowel of *bed* and that of *bad*, followed by neutral ɑ: bϵᵊ, ϵᵊ, ðϵᵊ, etc. The sound is heard in New England also, and of course from New England-born speakers elsewhere; the more usual American pronunciation is that with the vowel of *bad*, but longer, as bæ: əʳ, æ: əʳ, ðæ: əʳ, etc.

In all these cases SEng usage may in time spread over all England; but some of the extreme SEng peculiarities, such as the "long open o" (ɔ:, the vowel of *laud*) set forth by some English phoneticians as the "standard" English vowel in *pure, sure, lure,* etc. (as if the words were *pyaw, shaw, lyaw*), are not likely to become established outside of England. Their English acceptance would only widen the divergence of usage in England from that of other English-speaking countries.

Common to normal English everywhere is the reduction of all unstressed vowels to either the neutral ə, or (more rarely) a lowered "short i." Enclitic words may suffer further reduction; *e.g.* *has* may be heard as hæz, həz, əz, or -z. Recognition of the constant presence of these so-called "obscure" vowels is not general, however, because most people are hypnotized by the conventional spelling into thinking that they give the vowels some individual quality; they think they say fɔrtjunet (*fortunate*), proprɑi-itɔrz (*proprietors*), when they really say fɔᵉtʃənIt, prəprɑiətəz. The pronunciation of individual words is materially affected by the style of delivery, which varies from that of rapid familiar conversation to that of the professional "elocutionist." Neither furnishes standard English; the standard should be sought in the careful conversational style of educated people. The pedantic should be avoided with the slovenly.

At present hardly more than incidental attention is given to the teaching of English pronunciation in the schools. There is more or less work in what is called "phonics," but the basis of this work is rarely phonetic. The attempt is made generally with ordinary spellings, and combines spelling with pronunciation. The current reform in modern language teaching, which throughout Europe is basing all living language study upon preliminary mastering of speech-sounds on a phonetic basis, is beginning to affect methods in kindergarten and primary instruction in English. The Dale method in England has aroused interest; and similar work in Australia is described by John Smyth in *A Guide to a Modern Infant Room* (Melbourne). The usual method in American schools is the so-called "family" word method, exemplified in numerous textbooks. The chief need is thorough training of kindergarten and primary teachers by means of adequate courses in phonetics, as at present required in all Scotch and urged in all English training schools for teachers. Very little of such work is as yet attempted in the United States. Thorough work of this kind, especially if a precise and clear phonetic alphabet is employed, will do more than anything else to bring about an approximately uniform standard pronunciation of English.

With the growing importance of phonetics as the basis of language instruction, it seems only a question of time when a scientific phonetic alphabet, such as the International or some similar alphabet, will be in general use in all English-speaking countries, as already on the continent of Europe, for purposes of phonetic study and as a pronunciation key. In some larger dictionaries for general use, as *The Oxford Dictionary* in England and the *Standard Dictionary* in America, a scientific representation of pronunciation will be found.

Authoritative statement of the present facts of English pronunciation appears in books varying from the somewhat advanced treatment of Sweet to the conservative view of Storm. American English is described by C. H. Grandgent in *Die Neueren Sprachen*, II (1895). H. C. P.

See Dictionaries; English Usage; Language, English; Phonetics; Spelling and Spelling Reform.

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For further references see under Phonetics; also under Spelling, Teaching of.

PROOF. — See Demonstration; Evidence; Opinion; Truth.

PROOF, METHOD OF. — See Rediscovery, Method of.

PROOFS. — See Checks on Computation.

PROPORTION. — See Ratio and Proportion.

PROPOSITION. — According to one school, a proposition is the linguistic form in which the logical function of judgment is embodied. According to another school, it is the logical form in which the psychological function of judging acquires an objective logical status. In either case, a proposition is regarded as occupying the position of the primary complete unit of knowledge, lying between the term or concept, on one hand, and reasoning or consecutive discourse, on the other. A proposition is the assertion of a relation, positive or negative, between objects, it making no difference as to the logical character of the proposition whether these objects are physical, mental, or mathematical elements, or complex social and historical events. In the traditional Aristotelian scheme, every proposition consists of a subject, that about which something is asserted, and a predicate which affirms or denies something of the subject. Modern logicians generally agree that the subject-predicate form is not essential to a proposition, marking a peculiarity of the Aryan group of languages rather than a fundamental logical property. In all existential propositions, however, as distinct from those which assert simply a universal connection of elements without reference to whether the elements connected are themselves taken to exist, it may be said that there must always be a logical subject, namely, the existence denoted by the relation asserted in the proposition. This subject, however, need not be either the psychological or the grammatical subject, and need not even appear in the proposition as a linguistic form. Predication is then the entire qualification which is referred to the existence in question. Aside from the distinction of affirmative and negative propositions, the most important distinctions are the universal and the particular, the former being hypothetical, asserting a relation between conditions irrespective of the existence at any time or place of the conditions so related, and the latter asserting one or more things to which the relation applies.

For educational purposes, the interest attaching to the topic of propositions has to do with the importance for thought and knowledge of explicit statement and formulation. All thinking involves abstraction, but this abstraction evaporates into vagueness and ambiguity unless fixed and held before the mind by means of a term (*q.v.*) so that it may be referred to some situation, that is to say, made concrete through application. It is the function of a proposition thus to fix and apply ideas otherwise vague and fluctuating. While the importance of propositions or formal statements has been often wrongly understood, through failing to see the need of an empirical situation out of which a meaning or idea emerges and to which it is applied, it is none the less true that the stating, the holding and defining, function is absolutely indispensable to any adequate acquisition of knowledge. While the particular form of words in which the act of holding and stating is expressed may be more or less arbitrary, the function of reviewing, summarizing, and holding together is indispensable, even to the earliest and crudest operations of knowing. J. D.

PROTAGORAS (*c.* 485–411 B.C.). — The first and greatest of the Sophists, who won a high reputation as a teacher and philosopher at Athens and in Sicily. His instructions were so highly valued as a preparation for public life that princely fees were paid for them. Although the work of Protagoras and the Sophists has been severely criticized, it ranks in importance along with that of the Humanists and the Encyclopedists. His philosophy was agnostic and its effect was to destroy the intellectual foundation of polytheism and prepare the way for the teachings of Socrates and the Stoics. He has been regarded as the originator of the sciences of logic, philology, and grammar, and the distinction of genders and moods is attributed to him. His chief works, of which only a few fragments remain, were *On Truth* and *On the Gods*. W. R.

See Sophists; Greece, Ancient, Education in.

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PROTESTANTISM. — See Reformation and Education.

PROVERBS. — The educational importance of proverbs after the time of the Renaissance was based on their use by ancient writers, *e.g.* Aristotle, Chrysippus, Cleanthes, Plutarch, Theophrastus, Suidas, Plato, King Solomon, "the gravest senators, the greatest emperors, the inspired pen-men of sacred oracles." Finally, the example of Christ was cited. Thus for subject matter the proverb was regarded as a type of precept, and the virtue of this kind of teaching Vives says is that "everybody can soon con them and bear them in mind." The educational importance attached to proverbs may be judged by the large number of editions of Erasmus' (*q.v.*) *Adagia* and *Apophthegmata*. In 1562 John Heywood composed a popular work entitled *A Dialogue conteyning* *the number of effectuell proverbes in the English tounge*, and in his Preface, he states their use: "And their sentences include so good a reach, That almost in all things good lessons they teach." The most important school textbook of proverbs was that of John Clarke (*q.v.*), in 1639. It is founded avowedly on Erasmus' *Adagia*, but Clarke not only dwells upon the preceptual value of proverbs, but also regards them as "especially profitable" to scholars for attaining "elegancy, sublimity and variety of the best expressions." It was on this ground that Charles Hoole (*q.v.*) recommended their use, in his *New Discovery of the Old Art of Teaching School.* Besides Erasmus, Reusner's *Symbola* and Lycosthenes' *Apophthegmata* (1555) were widely used for Latin, and for Greek the collection by Posselius (1595). (See ORATION, SCHOOL.) Clarke states the pedagogical use of proverbs to be, "for the master to cause his scholars every day to repeat a head or two and interpret them and appose his scholars therein; or cause one boy on a form to appose and ask another. This will both teach and remind them of all learning, history, and antiquity; and be a synopsis of most useful and delightful passages in their whole life." He affirms that the benefit of such practice will soon be found to be "incredibly great." The number of collections of proverbs for purposes of the school or scholars was enormous, and in the teaching of all languages (*i.e.* not merely Latin and Greek) the proverb played a great part in the sixteenth and seventeenth centuries. Bacon spoke of the high value of collections of acute short sentences, and Cowley (*q.v.*), in his scheme for the *Advancement of Learning*, thinks that the progress of natural science would be helped by the collection of scattered little proverbs amongst the ancient poets. F. W.

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PROVISIONAL APPOINTMENT. — See TEACHERS, APPOINTMENT OF; PROBATION.

PROVOST (Lat. **Prepositus**). — An official term of very early use, *e.g.* for the rector of a manor (*cf.* the *Prévot des Marchands* at Paris), for the abbot of a Premonstratensian monastery, etc. Thence naturally transferred to the head of certain colleges at different universities, *e.g.* Oriel at Oxford, King's at Cambridge, etc. The term is occasionally used in America to designate the chief executive of a university, as at Pennsylvania (*q.v.*) or more recently, as revived at Columbia, to designate an office between that of president and that of dean.

PRUDENTIUS, AURELIUS CLEMENS (348–*c.* 410). — The chief early Christian poet, born, as it is supposed, at Saragossa. He held a court appointment which he gave up on becoming a Christian. He went to Rome, and the sight of the Catacombs and stories of the martyrs made a deep impression on him. He retained his love for ancient Rome, joined with enthusiasm for Christianity. His chief work from the educational point of view is the *Psychomachia*, which Mr. Glover interestingly translates as the *Holy War* (recalling Bunyan's work). This work was one of the most popular of medieval writings and is of importance in connection with the development of medieval art; it certainly exercised a greater educational influence than any other of Prudentius's writings, which persisted even into the sixteenth century. Thus Dean Colet in his Statutes for St. Paul's School (1518) prescribed Prudentius, and as late as 1583 Archbishop Grindall named Prudentius as one of the Latin verse authors to be read in the Free Grammar School of St. Bees in Cumberland.

The *Psychomachia* was a didactic allegory written in Latin hexameters, in which the Christ-given virtues fight against the vices which threaten the soul. Linguistically, Prudentius, whilst copying old classical models, introduces new words for church purposes, together with archaic forms on the one hand and contemporary terms on the other. In his work, *Against Symmachus*, Prudentius appeals for the abolition of gladiatorial shows. F. W.

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PRUSSIA, KINGDOM OF, EDUCATION IN. — See GERMANY, EDUCATION IN.

PSEUDOSCOPE. — An instrument which reverses the relations of the stereoscope (*q.v.*). The image which would naturally fall on the right eye is thrown into the left eye, and the image which would naturally fall on the left eye is thrown into the right eye. The result is that objects which would normally be perceived as solid are seen as hollow, and, conversely, objects which are normally hollow are seen as solid. Remote objects are seen in the foreground, and objects in the foreground are projected to a distance. C. H. J.

See PSYCHOLOGICAL LABORATORY, EQUIPMENT OF.

PSYCHASTHENIA. — A mental disease with symptoms similar to many of those found in neurasthenia (*q.v.*), and by some authors considered to be the mental counterpart of the latter. This disease commonly begins in childhood during the years of growth or at the adolescent period, and, without appropriate treatment, it continues for years with periods of exacerbation and betterment. It is found to arise particularly in those children who are timid, impulsive, irritable, moodish, scrupulous, suspicious, passionate, or awkward.

When the disease becomes fully developed, the symptoms are of great variety, including tics (*q.v.*), impulsions, phobias (*q.v.*), simple manias (*e.g.* dipsomania, etc.), obsessions (*q.v.*), and impulsions which are irresistible: kleptomania, pyromania, etc. The patient is anxious and there is often agitation, which may be purely mental, composed of such processes as continued interrogations, a tendency to counting (counters or arithmomaniacs), or it may result in attempts at expiation for certain (true or supposed) acts, which are judged to be wrong. The agitation may also lead to the formation of one or numerous phobias which may be fixed or may be shifting in character.

With these purely mental symptoms there may be vague feelings of discomfort or there may be exaggerations in the form of neuralgias; the vasomotor system may be disordered and the individual sweat at the least provocation. After, and sometimes before, puberty the genital sense is often altered, and it is common to find lessened sexual ability. The questionings and scruples and feelings of expiation may lead to sexual perversion, to the performance of sexual acts in unnatural ways (see Sexual Anomalies), and as an effect of the feelings of need of expiation there may result an automutilation.

The attention is affected; it becomes lessened; sometimes it is impossible for the individual to attend to things even for short periods of time. With this there may be a consequent memory defect and a disturbance in thought sequence or in normal associations. Feelings of incompleteness and of insufficiency arise and lead to troubles of the will. Movements become maladroit; walking may become slow and otherwise abnormal, and there may be an aboulia. All these lead to what Janet has described as a difficulty of adaptation of mental operations to external conditions.

Some of the symptoms in this disease have, in later life, been analyzed and have been found to be dependent upon mental traumata or accidents in childhood. This is true for the obsessions, phobias, impulsions, etc. Freud considers the state of anxiety to be a special form of psychoneuroses, and calls it anxiety neurosis, but in this he is not supported by many others who have given close study to the disease. The important fact, however, which has been demonstrated by Freud is that many of the states of anxiety, even though they be without any mental content of a sexual nature, are due to sexual traumata at an early age. It should be noted that the term sexual in this connection has not the same connotation as is usually given it in English; the term being here used in the German sense. In all the conditions, whether due to sexual or other accidents, the individual attempts to escape from the thoughts and impulses which arise, and a substitution takes place which leads to acts not in harmony with the external conditions. It is because of this substitution or replacement that abnormal modes of reaction arise, the individual often being unconscious of the reason for the particular acts or mental processes. This is the underlying condition in the "complex" which may attain such a magnitude or degree that the thoughts and actions appear like those of the insane.

Psychasthenia is on the whole a curable disease, the possibility of cure depending upon the ability to discover the causative factors. Rest is not indicated here as it is in neurasthenia, and, in fact, enforced rest may lead to asthenia or aboulia, in which condition the patient is worse than before. Spontaneous recoveries occur, but usually the psychasthenic state is progressive until the cause is removed. Because of its origin (in childhood) and of its cause (mental traumata in childhood), the disease commonly begins during the school period, and it is influenced in many ways by school work. Since treatment does not depend upon rest, the child should be kept at school work, and attempts on the part of the teacher to bring about orderly sequence of thought and proper adjustments may be beneficial.

S. I. F.

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PSYCHIATRY. — Literally the cure of the mind, but used as a general term for the study of mental diseases. While all mental abnormalities are included under this term, the psychiatrist deals mostly with those which require treatment in the hospitals for the insane or for the feeble-minded.

Mental diseases have been studied in a variety of ways, and attempts have been made from time to time to classify all of the various types of the disorders symptomatically, *i.e.* according to similarities of symptoms; *e.g.* any kind of excitement was called mania, all kinds of mental depression were called melancholia, etc. But any symptomatic classification must necessarily be inadequate unless there be many cross classifications, *e.g.* melancholia associated with motor excitement, etc.

A similar symptomatic arrangement was made by classifying mental diseases according to cerebral localization, known or supposed, *e.g.* those showing increases or decreases in motility or in ideation (Wernicke). Again, numerous attempts have been made to group various forms of insanity in accordance with etiology, and this led to the grouping of cases which outwardly show very diverse symptoms, but which superficially appear to have a single cause, *e.g.* insanities from accident, childbirth, alcohol, etc. Recently, however, there has been an effort to group the insanities according to no single criterion, but in accordance with the cause, course, and outcome, the work chiefly of Kraepelin. When the three criteria are taken all together as evidences of particular diseases, various forms of insanity may be grouped into about ten general classes. In addition there are many subheadings, *e.g.* in the group toxic-psychoses are found all forms of intoxication due to extraneous causes. (See INTOXICATION; ALCOHOL, THE USE AND PSYCHOLOGICAL EFFECT OF.)

The results of the investigations of brain diseases are of special interest to the teacher, for they show unmistakably that the origin of many disorders is to be found in childhood, even as early as the fifth year. The abnormalities are slight at first, but they gradually increase until they lead to commitment to an institution. But by proper treatment in early years slight abnormalities might be aborted or replaced by normal ideas and actions. It is because the psychiatrist usually sees the result of a disease of many years' standing that he is often unable to deal with it in any curative manner and that he is often compelled to be a caretaker of the insane rather than a physician. S. I. F.

For further details on the causes, duration, treatment, recovery, etc., see INSANITY. See also DEMENTIA PRECOX; EPILEPSY; HYSTERIA; MANIA; MELANCHOLIA; NEURASTHENIA; PARESIS; etc.

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PSYCHIC. — An adjective which is used as a synonym of "mental." It refers to all of the activities of the mind (Greek *psyche*). The longer form of the adjective, psychical, has in recent usage been employed for the most part to refer to spiritualistic phenomena.
C. H. J.

PSYCHICAL RESEARCH. — When this term is defined as the "examination of the amount of truth contained in world-wide superstitions" (Andrew Lang), the definition is based upon the unity of interest and attitude which the term represents in the *Proceedings of the Society for Psychical Research* (S.P.R.), founded in 1882. The definition may be supplemented by adding to it: the interpretation, by the aid of psychological principles and theories, of the phenomena investigated. Yet the testing and warrant of the supernormal has determined the current of the movement, and has in so far aroused the critical skepticism of the guardians of the scientific interests of psychology. The program of "psychical research" as the examination of the questionable but traditionally or fallaciously accredited in the realm of mind is largely open to the preferences of shifting interest. Of the subjects assigned to the original committees — sufficiently suggested by the terms telepathy, hynoptism, apparitions, spiritualism, premonitions, etc. — those possibly evidential of supernormal, extrahuman, or rare and irregular powers and forces, have attracted largest attention and built up a voluminous literature. These outlying phenomena, when substantiated, may be incorporated into the borderland of psychology, and thus yield additional data illustrative of psychological relations; or they may resist such incorporation and be accepted by those convinced of their validity as subversive of or demanding an extension of the limits of psychological science. Since the content of "psychical research" tends to drift away from the former and towards the latter position, it traverses obliquely and irregularly the developing trends of psychology. The resulting detachment from psychology is the issue of a diversity of interest as well as of a general perspective of procedure, purpose, and value.

The question of telepathy has been a leading one in psychical research. It is capable of experimental test; but the results thus reached (unless entirely negative) may be interpreted to indicate that telepathic action is obscurely limited by conditions and by the psychological state or endowment of rare individuals. The hypothesis is largely used to account for, and is also regarded as supported by, the spontaneous transfer of appearances (phantasms), warnings, information, etc., in critical situations, from a distant agent to an interested percipient. The "veridical" nature of such appearances or messages, at times approaching the status of a prediction anticipating a corroboration by ordinary channels, forms the crux of the problem. To eliminate chance, plausible anticipation on the basis of acquired knowledge, subconsciously assimilated information and shrewd emotional logic, is most difficult, and the establishment of a negative can hardly exhaust the possibilities of the case. The hypothesis once entertained or accepted offers endless extensions to account for revelations, premonitions, etc. That this entire body of evidence has been critically reviewed with reference to its incorporation within the accredited range of psychological processes is set forth in the article on telepathy (*q.v.*).

The phenomena associated with *mediums* and spiritualism form a second large division of psychical research. The physical phenomena relate primarily to the behavior of inanimate objects in the presence of the medium in apparent defiance of physical laws. The levitation of tables and movement of objects remote from the medium are typical. Here again the essential logical step is to establish the negative that the movements are not due to the undetected efforts of the medium or of sympathetic participants (table turning: see SUBCONSCIOUS). If mediums were willing to accept conditions prescribed by physical science, the claims could be definitely and promptly tested. They invariably impose their own conditions, yielding on irrelevant details; so that the investigation becomes a contest of shrewd observation on the part of handicapped investigators to detect a *modus operandi* concealed by darkness, by the regulations of the séance, and by the prescribed repertoire of the medium, and the rejection of crucial variations in the tests. The large amount of fraud detected in detail, the yet larger suggestion of suspicious circumstance, give to this branch of investigations a fairly conclusive presumption of a negative issue; at the same time a laxity of caution, an unfitness for the rôle of detective, and a variable credulity contribute to the accounts of such physical séances an element of extravagant marvel. The other division of "mediumistic" phenomena relates to the revelation on the part of the medium (by trance utterances, automatic writing, answers to questions, etc.) of facts, events, utterances, confidences, etc., presumably inaccessible through ordinary channels. The conclusion that such revelation of private details requires the belief in the "control" of the medium's mind by a departed spirit constitutes the hypothesis of spiritualism. It is equally open to conclude that returning spirits are responsible for the physical manipulations. The evidence offered in support of this view is endless and of great variety, but most difficult to appraise. The case of spiritualism has been concentrated upon the more critical examination of the revelations of a few mediums, under conditions apparently incompatible with intentional fraud. If such mediums are unwilling and unable to coöperate by revealing what they know of their own methods, progress seems blocked and the situation baffling. The very large allowance to be made for skillful "fishing" on the part of the medium, for unintentional prompting on the part of the sitters, and for the general neglect of significant detail, for malobservation, for unwitting shaping and exaggeration of personally disturbing incidents into marvels, must remain as a substantial discount of all such records. The further development of these phenomena in evidence of ghosts, haunted houses, etc., forms a point of historical connection with ancient and popular beliefs. Their resurrection is dependent upon the standing to be assigned to the mediumistic revelations recorded in the *Proceedings of the S.P.R.*

A field illustrating the manner in which the interest in psychical research cuts across the differently motived pursuit of psychological analysis, and does so in part profitably with an enlargement of insight, is that of the investigation of abnormal states, of hypnosis, automatisms, crystal gazing, etc. The possible relation of the telepathic or clairvoyant power to the altered mental condition of the hypnotic subject has led to the use of hypnosis as a means of studying such powers. It has also led to the general conception of a subconscious phase or organization of personality, "subliminal self," which in turn is called upon to support apparently supernormal operations and impugn the adequacy of the conception of consciousness in accredited psychology. Accordingly the mediumistic revelations may be subliminal; but the endowment of the subliminal self with powers transcending in type and scope those of the accredited conscious self again forms a parting of the ways for psychical research and for abnormal psychology. The bearing of cases of dual personality upon the interpretation of trance states has been acknowledged and availed of on both sides. (See SUBCONSCIOUS.)

The miscellaneous group of investigations supported by the psychical research interest adds little to its content, but sustains its relation to current beliefs and practices. Their study has contributed to the history and anthropology of the belief habits of mankind. There may be mentioned the study of the divining rod, of other types of "sensitives," of "poltergeists" and haunted houses, of collective hallucinations, of theosophical and similar marvels. Of different temper is the very valuable study of the sources of error in reports of and beliefs in supernormal phenomena, — the psychology of the sitter in the séance, of deception, of prepossession, of credulity, of fraud, and of fanaticism.

While the net issue of this vast labor seems proportionately slight and the supporting interest detracts from the sturdier and more systematic pursuit of psychology, and while

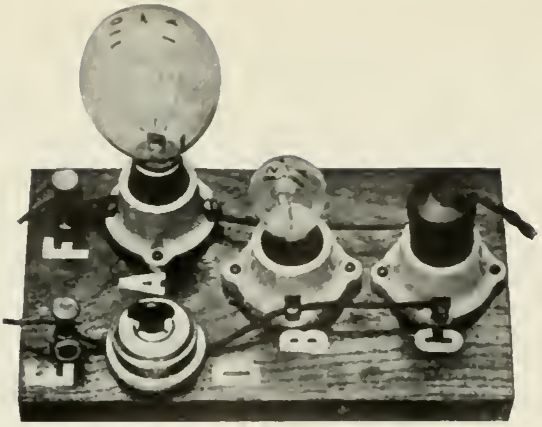

Fig. 1.

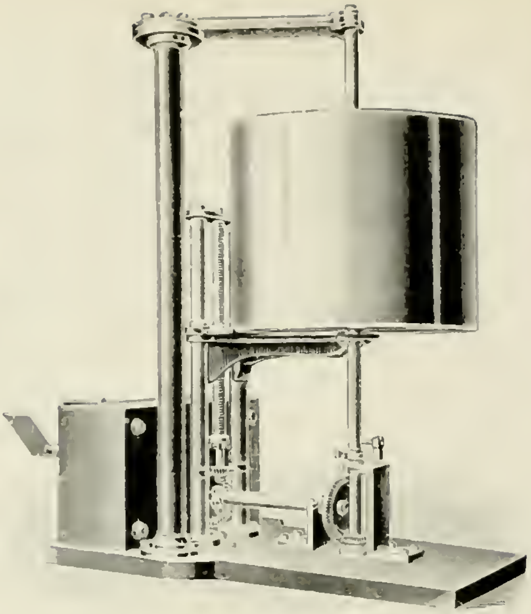

Fig. 2.

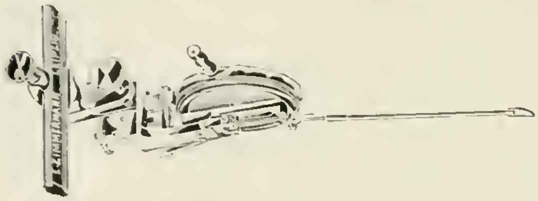

Fig. 3.

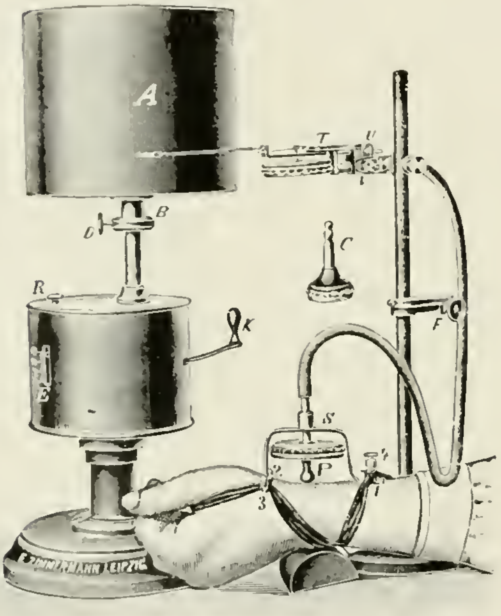

Fig. 4.

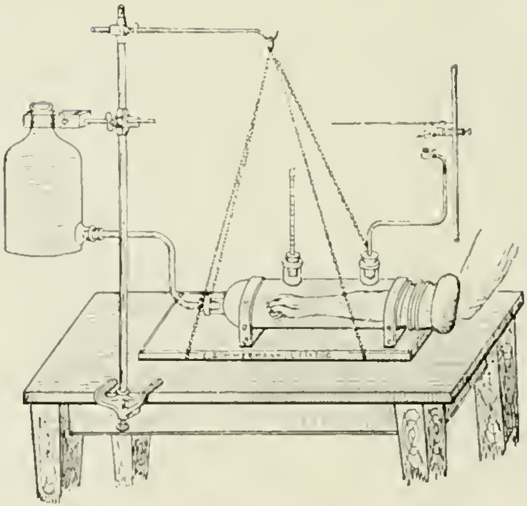

Fig. 5.

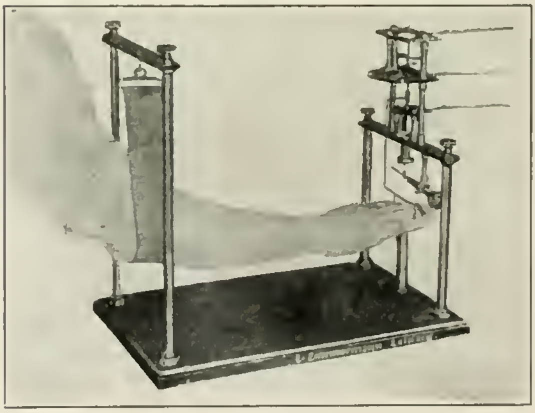

Fig. 7.

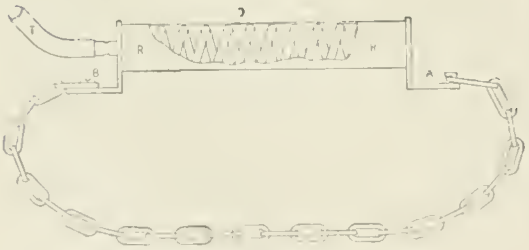

Fig. 6.

Apparatus for the Psychological Laboratory.

the eager straining for results corroborative of traditional beliefs seem to many equally illogical and undesirable, the indirect service performed by psychical research should be recognized even though the untoward tendencies are deplored. The division of opinion in point of view, interpretation, and conclusion appears conspicuously in the literature, both among the contributors to psychical research and among academic psychologists. J. J.

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See also references under TELEPATHY; SPIRITUALISM; SUBCONSCIOUS.

PSYCHOANALYSIS. — A method used in the investigation of mental disorders, depending upon the arousing of associations (*q.v.*) which have been dormant, and upon the discovery of the beginnings of the abnormal mental state. Many of the disorders of mind (see INSANITY) are known to arise from fright and other emotional excitements in childhood. These lead to altered reactions, and by psychoanalysis attempts are made to trace the genesis of the disorders. The method has a psychotherapeutic value in that the analysis leads to explanations and reconstruction, which in turn produce better views of life and more normal reactions (see PSYCHOTHERAPY). S. I. F.

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PSYCHOLOGICAL LABORATORY, EQUIPMENT OF. —The psychological laboratory usually consists of a series of rooms rather than a single large room, isolation being an important factor in psychological experimentation. Of these rooms it is desirable that one should be dark, for purposes of experiments in vision, and that another should be soundproof for experiments in hearing. All rooms should be furnished with the electric current and with some means of readily reducing and varying the current. Various methods of varying the current are used. The most satisfactory method, apart from the expense involved, is the use of a sufficient number of transformers. A less expensive initial outlay is required for the Scripture lamp batteries, Fig. 1. In these the current is made to pass through the lamps at *A* before being drawn off at *C*, thus reducing the current. The small lamp *B*, placed in parallel with the apparatus, serves to eliminate the spark when the apparatus circuit is broken. (See Judd's *Laboratory Equipment for Psychological Experiments,* pp. 4–6.) Another simple form of resistance is described in Titchener's *Experimental Psychology, Students' Manual, Quantitative,* p. 128. It is also desirable that a psychological laboratory should have a compressed air supply, running water, and gas. A dark room for photographic purposes and a workshop equipped with lathe and other machines for working in metal and wood are valuable adjuncts to the laboratory.

The following is a description of some of the most important pieces of apparatus and of the uses to which they are put: —

Kymograph (Fig. 2). This is a clockwork device for revolving a brass cylinder or drum. The apparatus is usually so constructed as to make it possible to use the drum in either the horizontal or the vertical position. The speed at which the drum revolves may be varied to suit the needs of the experiment. The drum, which is detachable, is covered with a band of glazed paper and revolved over a gas or other flame, which leaves a deposit of soot upon its surface. This makes a convenient surface for all sorts of graphic records. After the record is made, it may be preserved by passing it through a solution of shellac which hardens the surface. If a longer record is desired, a second drum, mounted on a carriage, may be used, and a belt of glazed paper of any desired length may be stretched between this and the drum of the kymograph. Under such conditions the shellac is applied to the inner side of the paper.

The tambour (Fig. 3) is an instrument for making records of movements upon smoked surfaces such as have been described. The hollow bowl is covered by a thin piece of rubber and communicates by means of a piece of rubber tubing with a similar bowl detached from the rest of the apparatus. Any movement in the rubber surface of the latter is communicated to the rubber surface of the former. This surface is attached to a light lever at a point not far from the fulcrum, and a metallic point at the other end records the movement thus magnified upon the smoked surface of a drum. A single tambour may be used in conjunction with the sphygmograph (Fig. 4), which in the form represented in the figure is merely a special kind of tambour for registering the movements of the radial pulse.

The plethysmograph (Fig. 5), which registers changes in the volume of blood in the arm, is also used in conjunction with a tambour. The arm, covered with a rubber sleeve, is inserted in the cylindrical chamber, and the rubber sleeve is fitted over the end of the cylinder so as to make it watertight. The chamber is then filled with water, which rises in the glass tube to any desired height. The glass tube is connected with a tambour. The height of the water in the tube varies with changes in the volume of the arm, and these changes are thus registered by the tambour.

The pneumograph (Fig. 6) is a steel spring covered with rubber, thus making an expansible air chamber. When bound around the chest or abdomen, the breathing movements may be recorded with the aid of a tambour.

More complicated forms of apparatus make use of the principle of the tambour for the recording of movements. Figure 7 shows such an apparatus designed to record finger movements in three dimensions. Figure 8 shows a similar device for head movements.

The planchette is an instrument for recording involuntary arm movements. It consists of a narrow board, suspended by cords and adjustable to any required height, upon which the arm rests. One end of the board is provided with a steel pen which is allowed free play through a hole in the board and writes upon the surface of the paper below, thus recording all horizontal movements of the arm.

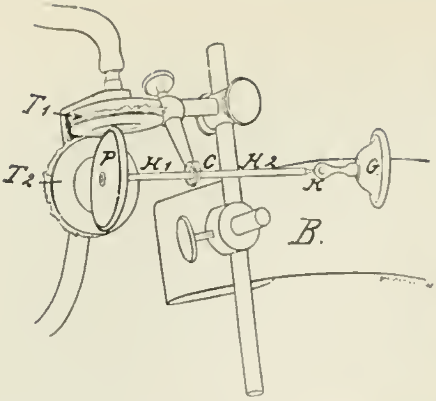
Various forms of apparatus are used for measuring work. The simplest form is the dynamometer shown in Fig. 9, which consists of a steel bow which is placed in the hand and compressed. The amount of pressure is indicated on the graduated disk.

The best known form of ergograph, or work measurer, is that of Mosso, shown in Fig.10. A string passing over a pulley holds the weights and is attached at the other end to the finger of the subject to be tested. The remaining fingers and arm are securely fastened to the arm rest so as to isolate the work of the one finger. A recording point moves with the string over the surface of a revolving drum. The amount of work done is computed by multiplying the total height of these movements by the weight lifted.

The time relations of various processes may be measured by the use of an electrically driven tuning fork (Fig. 11). These forks are made with any desired frequencies, *e.g.* 100 vibrations per second. The fork is mounted upon a wooden base and a magnet is placed between the prongs of the fork. One of the prongs of the fork is provided with a spring with a platinum point, which rests against an adjustable button. An electric current is passed through the fork by attaching the wires from the source of supply to two binding posts, only one of which is shown in the figure. The current passes through the prong of the fork to the spring and button, thence through the coils of the magnet, and out at a second binding post. When the current passes through the magnet, the prongs of the fork are drawn inward and the contact of the platinum point with the button is momentarily broken, thus interrupting the current through the magnet and allowing the release of the prongs outward, thereby affording a second connection between the spring and button, when the process is repeated in a similar manner. In this way there is a continuous breaking and making of the current, and the fork is made to vibrate continuously at its proper rate. By adjusting the fork in such a way that the recording point at the end of the prong of the fork moves upon the smoked surface of a revolving drum, a time record is obtained in the form of curves, each of which indicates a time period of the same duration as one vibration of the fork. The time of any process recorded simultaneously with the vibrating fork upon the drum may thus be obtained. The lower curve of Fig. 12 is such a time line, the upper curve being a pneumograph record taken simultaneously. Other means of obtaining a standard time record are the Jacquet chronometer and the electric contact clock. The former (Fig. 13) is essentially a stop watch with a recording point beating seconds. By a different adjustment it may be made to beat at the rate of five per second. The electric clock (Fig. 14) makes and breaks an electric current at a rate which varies from once a second to once in twenty-four hours, according to the adjustment.

In all cases where the time record is obtained from the making and breaking of an electric current it is convenient to use an electric marker (Fig. 15). This instrument consists of a pair of bar magnets, which are placed close to a spring. The spring is pulled towards the magnets at any moment when the current passes through them. As soon as the current is broken, the spring is released and pulled away from the magnets. The moving spring is attached to a recording lever. Such a marker, when placed in circuit with an electric fork or any other electric current which is made and broken at a known rate, serves as a convenient means of making a time record upon the smoked surface of a drum. The electric marker is also used in many other connections, as, for example, in the reaction experiment, where it is necessary to know the exact moment when a certain activity takes place. In the reaction experiment an electric contact key, of the type shown in Fig. 16 is used. When the finger presses down the spring of the key, the current is made. The moment the finger releases the spring, however, the current is broken. Such a key, when placed in the same circuit with an electric marker, gives a method of recording the moment at which the finger movement takes place.

Figure 17 shows a form of apparatus the principle of which is useful in the measurement of a number of the optical illusions. The figure shows the form used in connection with the Müller-Lyer illusion. The drawing of the lines is made upon two separate pieces of cardboard



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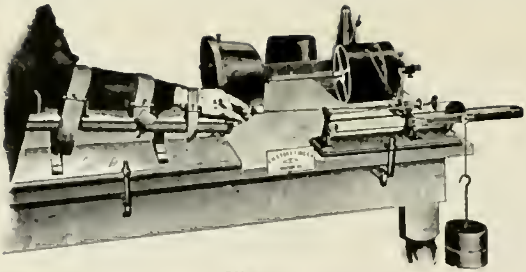

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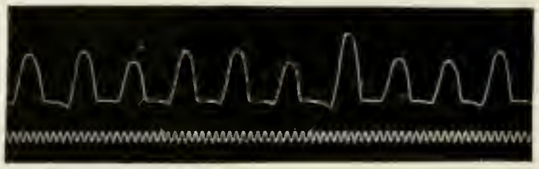

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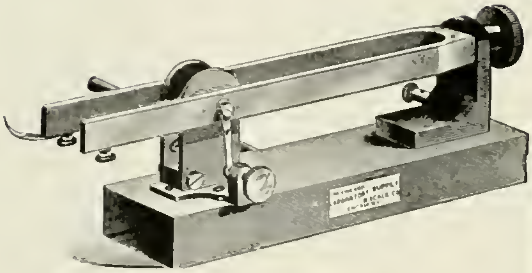
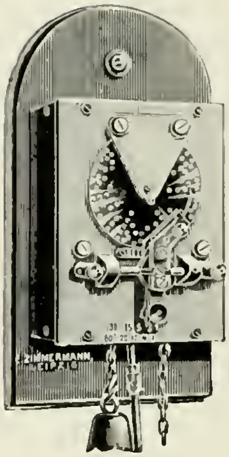


Fig. 11.

Fig. 9.



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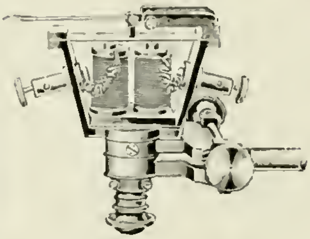

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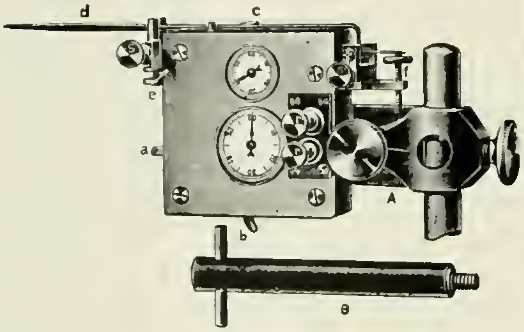

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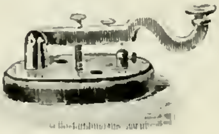

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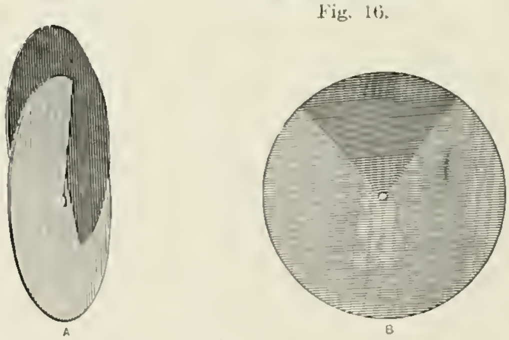

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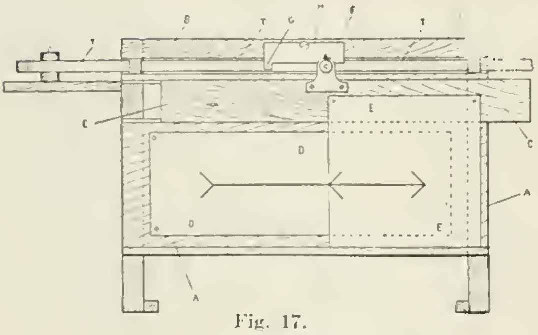

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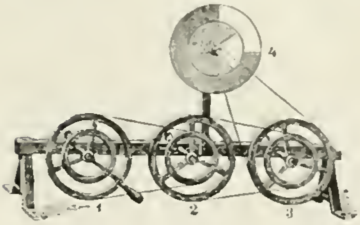

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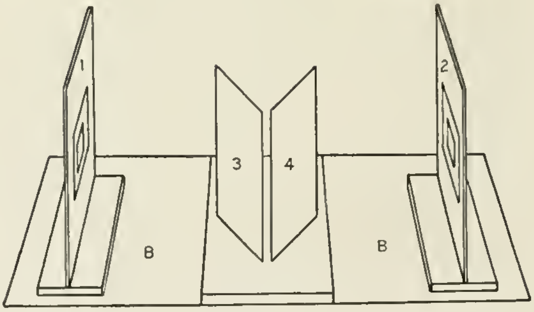

Fig. 20.

Apparatus for the Psychological Laboratory.

which, when placed together, one overlapping the other as in the cut, form the Müller-Lyer figure. One of these cards, *D*, is fastened to the immovable base of the apparatus. The other is attached to the slide *C*. The subject adjusts the slide so as to make the two horizontal lines appear equal. The amount of error, *i.e.* of the illusion, may be directly measured or it may be recorded upon the tape *T* and measured later.

Figure 18 is a color mixer. Colored disks may be slit and placed together so as to show any desired proportion of the various colors to be mixed. (See Fig. 19.) When these are fastened to the arbor and the wheel is revolved, the speed of revolution is so greatly increased as to cause fusion of the colors, giving rise to the phenomenon of color mixture. A more convenient form of color mixer consists of an electric motor capable of a speed rapid enough to produce fusion of the colors.

Several forms of the stereoscope are to be found in psychological laboratories. The drawing of Fig. 20 shows the construction of the Wheatstone mirror stereoscope. Two mirrors (*3* and *4*) are placed together at an angular position which may be varied to meet the needs of the experiment. The pictures or drawings to be fused are placed upon the upright boards (*1* and *2*), the distance of which from the mirrors is also adjustable. The apparent position of these pictures is behind the mirrors. The lens stereoscope is so well known as to need no description here. The stereoscope may also be used for the demonstration of retinal rivalry.

Figure 21 shows the principle and construction of a simple form of pseudoscope. It consists of a box with three openings at *A*, *B*, and *L*. In front of *B* is a mirror, *M*, placed at an angle of forty-five degrees with the side of the box. Parallel to this mirror is another mirror M^1 in the corner of the box next to *A*. If the left and right eyes are placed at *A* and *B*, respectively, the left eye sees any object such as *D* straight ahead, while the right eye will have an object occupying a position such as *O* reflected to it by the two mirrors. The relation between the two eyes is thus reversed and a pseudoscopic effect produced, *i.e.* solid objects appear hollow, and hollow objects, solid. If the openings *B* and *L* are used for the left and right eyes respectively, it has the same effect as if the eyes were at a much greater distance apart than is actually the case. When used in this way, the instrument is known as a telestereoscope.

The stroboscope (Fig. 22) consists of a cylindrical device with slits through which the observer looks at pictures of successive phases of a scene involving movement of any kind. When the stroboscope is revolved rapidly, the pictures are exposed in rapid succession and fused so as to give the perception of movement.

The color perimeter (Fig. 23) is for the purpose of testing the character of indirect vision. The subject seated at the center of the arc gazes directly in front of him with one eye, the other being covered, and notes the qualities of colors appearing at various points of the arc. Under these conditions the colors fall upon the non-foveal regions of the retina, any point of which may thus be tested as to its sensitivity to the particular color used.

The tachistoscope (Fig. 24) is an apparatus for making short exposures of words, figures, etc. A falling slide is released by a magnet, thus momentarily revealing the exposure field. The time of exposure may be regulated by the height of fall of the slide.

Figure 25 represents the auditory cage, which is used for investigating the properties of auditory space. The subject is seated within the cage, the two ears being at equal distance from the rim *A* and at the same height. Some source of sounds, such as a telephone, is attached to the rim and may be moved any desired distance by revolving the apparatus. The distance may be read off at *R*. Two telephones may also be used, and the effect of fusion when they are placed at various distances from the ears may be thus determined.

The simplest method of producing tones is by means of tuning forks and resonators. Figure 26 represents two forks of the same pitch, one of which, however, is adjustable in pitch by means of weights which can be placed at varying distances from the end of the prongs. By comparing the tones of the forks just noticeable differences in pitch may be tested. Another simple means of tone production is by the use of a set of Quincke's tubes (Fig. 27), consisting of two glass tubes held together by a wire. The tube *B* is the mouthpiece and *S* is the sounder, the latter being closed by a cork. The highest audible tone is determined by Galton's whistle (Fig. 28). By pressing the rubber bulb the air is forced into the small tube *D* and against the tip of *E*. The length of the air column in *E* is regulated by the graduated screws *G* and *F*, and the rate of vibration is determined by the amount of turning of these screws. The lowest audible sound may be found by the use of simple rods held firmly in a vise and lengthened until the limit of audibility is reached.

The apparatus shown in Fig. 29 is designed to determine the threshold of just perceptible difference in sound. Two pendulums with hard rubber balls at their ends may be dropped from any desired height against the ebony block at the base of the apparatus. The distance may be read off from the graduated arcs. The pendulums are set in motion successively from slightly different positions, the distances being varied until the point at which the just noticeable difference of the two sounds is reached.

Figure 30 represents the æsthesiometer, for determining the spatial threshold of the skin. The hard rubber points may be separated at any distance, which can be read off on the scale. The shortest distance at which these points may be placed apart and yet be distinguished as two rather than one is regarded as the spatial threshold for the region tested. Blunt metallic points are used for exploring the skin for warm and cold spots. The sensitivity of the skin to touch may be tested by an instrument like that in Fig. 31, which employs a hair the length of which is capable of being varied. The shorter the hair the stiffer it is, and hence the greater the pressure exerted.

E. H. C.

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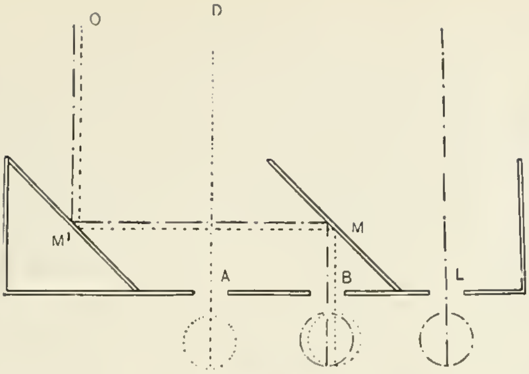
PSYCHOLOGICAL TENDENCY IN EDUCATION. — The term recently applied to that general tendency in education during the nineteenth century which stressed the importance of the knowledge of the child rather than a knowledge of the subject-matter as the basis of all teaching. The movement began with Rousseau (*q.v.*), who promulgated the doctrine that the child is the center of education. It was made more definite and reduced to schoolroom procedure by Pestalozzi (*q.v.*), who showed that education is a natural evolution of the child's nature. It was given a scientific formulation by Herbart (*q.v.*), and a philosophical by Froebel (*q.v.*). Both Herbart and Froebel had also tremendous practical influence on school work, — an influence which was in all its details but a practical exemplification of the fundamental belief given common expression by this term "psychological tendency." The latest phase of this tendency is seen in child psychology and the applications of experimental psychology to education. For the details the reader is referred to these various articles, on CHILD STUDY; CHILD PSYCHOLOGY; also OBJECT TEACHING; PSYCHOLOGY, EDUCATIONAL; FROEBEL; HERBART; PESTALOZZI; ROUSSEAU; TEACHERS, TRAINING OF.

PSYCHOLOGY. — History. — Psychology as a science is of relatively recent date. The earlier treatments of the subjects that are now included in psychology were of a metaphysical and speculative type. Thus the Greeks were always interested in the nature of the mind, in its origin, and in its relations to the world, but their treatments of these topics were of a broad speculative type. They described the mind as perpetual in its existence. Plato, for example, held that human consciousness in its present form is merely a carrying over of certain types of existence that have appeared in other forms in earlier ages, and will appear again in other forms in subsequent worlds. Again, the question of the distinction between mental reality and material reality was vigorously discussed during this earlier period. During the medieval or later speculative period the interests were chiefly theological and related to the soul and its functions. The immortality of the soul was very fully discussed; its unity and its relation to the world were also topics of engrossing attention.

During these earlier periods there are to be found at times descriptive accounts of consciousness which foreshadow the later developments of scientific psychology. Thus to cite a single conspicuous example, Aristotle wrote on memory, and by his accurate account of its operations laid the foundation for the later doctrine of the association of ideas. He described very fully the processes of memory which depend upon similarity, contiguity, etc.

With the beginning of the modern period, the metaphysical interest merged at times with purely scientific discussions. Thus, Descartes while writing upon the nature of reality was led to discuss the relation between the physiological organism and conscious processes. He gave an account of the nature of the reflex process, and discussed the question of the presence of consciousness in animals. Descartes developed the doctrine that the soul because of its unity must be seated at some point in the central nervous system which is not bilateral in its structure. He found such a point in the pineal gland, and was led therefore to regard this as the seat of the soul.

Scientific interests eventually superseded the metaphysical interests and led to the development of an independent science. Three major lines of development have contributed to psychology in its present scientific form. First, descriptive accounts of conscious processes became more numerous and exact with the development of modern thought on the subject of consciousness and its elements. The English school of psychologists has made a very large contribution to this type of psychology. Beginning with John Locke (*q.v.*), a whole group of psychologists described in detail the experience through which they passed in the perception of objects, and in the formation of ideas. This English school laid great emphasis upon the laws of association and has sometimes been described as the English Association School. In Germany a group of writers following upon Christian Wolff (*q.v.*), who wrote in 1732 his *Psychologia Empirica*, and in 1734 his *Psychologia Rationalis*, gave a very great impetus to a detailed description and discussion of mental processes. Tetens (1776–1777) furnished a classification of mental processes which has long done serv-



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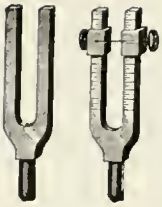

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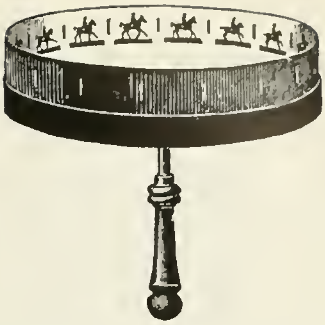

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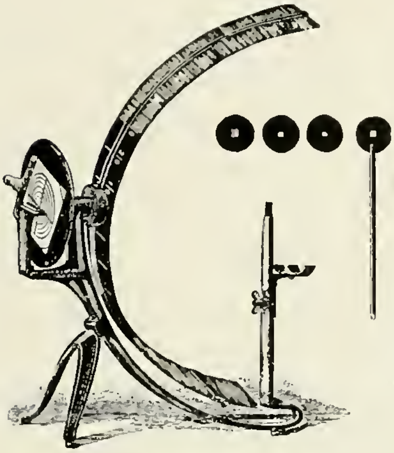

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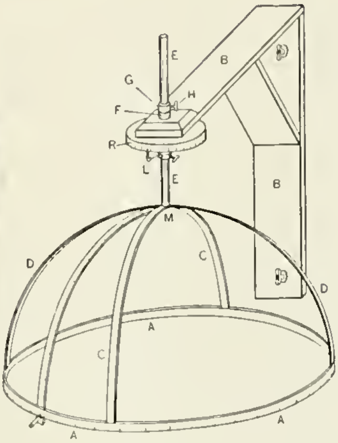

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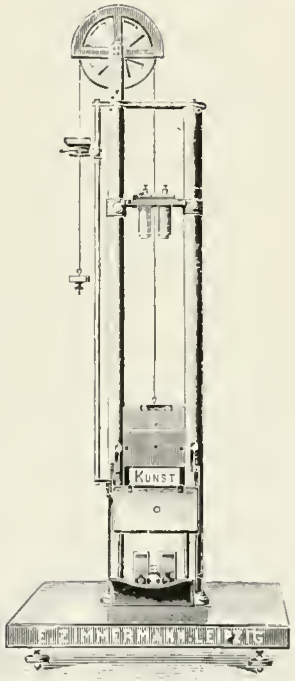

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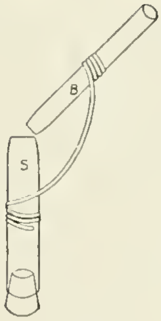

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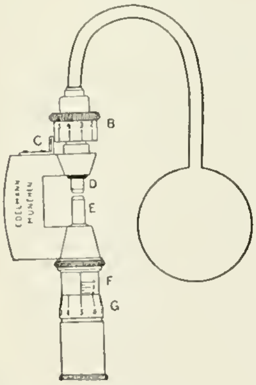

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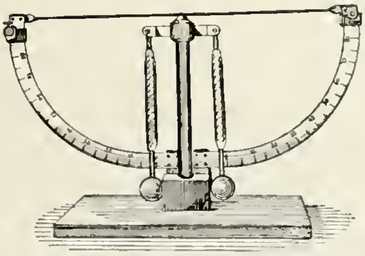

Fig. 29.

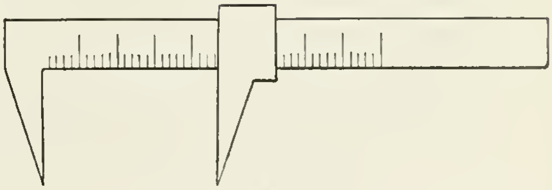

Fig. 30

Fig. 31.

Apparatus for the Psychological Laboratory.

ice in psychology. This classification became current through its adoption by Kant. It distinguished the processes of knowledge, feeling, and volition. This classification of mental activities continues to be used in all of our current discussions, and is very satisfactory as a first descriptive classification of the facts of mental life.

A second general type of scientific development, which has contributed to modern psychology, appeared at first as physiology of the senses and central nervous system. In the first half of the nineteenth century, a number of writers became interested in the detailed examination of the various senses. E. H. Weber published a series of treatises on the skin sensations and organic feelings, dealing with the problem from the point of view of the practical student of physiology and medicine. Indeed, the motive which Weber had for his investigation was the desire to develop a method of diagnosis through the measurement of the sensitivity of the skin. (See Weber's Law.) Later, Lotze published a volume entitled *Medicinische Psychologie oder Physiologie der Seele* (1852) in which he attempted to account for mental phenomena, especially abnormal mental phenomena, by a study of the physiological organism, and the relation between the activities of this organism and the mind. These earlier contributions were brought into systematic form by Wundt in his great work *Grundzüge der physiologischen Psychologie*, the first edition of which appeared in 1874. In 1887 Ladd's *Elements of Physiological Psychology* appeared in English, and marked a departure from the traditional form of psychology that had been current in this country before. The earlier psychologies had conformed very closely to the English association type of thinking, and had included many of the speculative metaphysical and theological discussions of the earlier period. Even Ladd's book contains many philosophical passages.

The third general type of scientific investigation which contributed to modern psychology is very closely related to the physiological studies above described. It arose from the development of experimental methods in psychology. Certain early experiments were undertaken in astronomy for the purpose of determining the personal equation. In 1795 the British Astronomer Royal found that his own records did not agree with those of others in the Observatory. He is said to have attributed the discrepancies between his own observations, and those of others, to errors on the part of his assistants. It was not until later, in 1820, that Bessel noted that his own observations differed in time from those of other equally competent observers. He undertook some experiments to determine the exact amount of these personal differences in observations. Such exact determinations of reactions opened up a field for experimental investigation which was very fully cultivated by the early students of experimental psychology in the last two decades of the nineteenth century. A great number of reaction time experiments (*q.v.*) under various conditions were worked out by these experimentalists.

A somewhat different type of experimental investigation was undertaken by G. T. Fechner, who reported in his *Elemente der Psychophysik*, 1860, his measurements on the differences between sensation intensities and their relation to external stimuli. He also worked out elaborate mathematical calculations in conjunction with these measurements (See Weber's Law.) In the meantime, Wundt was working on certain experimental measurements of the accuracy of space perception which he published in his *Beiträge zur Theorie der Sinneswahrnehmung*, 1862. Helmholtz had also made extended investigations upon optics and sound sensations, which included both experimental work and physiological studies. His *Physiologische Optik* and his *Lehre von den Tonempfindungen* appeared before 1862. These various investigations made it perfectly clear that accurate knowledge of mental processes, and the relation of mental processes to physical and physiological facts, can be secured only through careful and systematic observations carried on under well-controlled conditions.

The enthusiasm for physiological and experimental investigations in psychology was at first so great that a certain antagonism between these investigations and the older types of descriptive psychology seemed to develop. Many writers held that descriptive psychology was entirely superseded by physiological and experimental investigations. Psychological laboratories were established in German universities and in this country, the first being Wundt's laboratory in the University of Leipzig, established in 1878. Definite reaction against the subdivision of psychology has, however, in recent years made itself apparent. The descriptive writings of the earlier workers have been appealed to for much of the material which is to-day employed in suggesting and carrying out psychological experiments. The experimental methods, on the other hand, have been utilized to refine in all directions the observations of mental processes, and the physiological facts have been drawn upon very freely to supplement and support psychological studies. A general science of psychology strictly empirical in type and scientific in its method has emerged from the conflicting tendencies of the latter part of the nineteenth century.

No mention has yet been made of one of the writers who is of great importance in education, namely, Herbart (*q.v.*). Herbart's place in psychology is by no means as important as his place in education. His psychology was an effort to throw the descriptive accounts of his predecessors into the form of a series of mathematical equations. He explicitly attempted to develop a system of mechanics of the mind. This he did without experimental or physiological investigations, and the result was merely a series of abstract symbols expressing in obscure formulas the observations which had been set down by his predecessors in much more available descriptive terms. Furthermore, Herbart's psychology was based upon certain philosophical assumptions which are wholly unproductive for the empirical science. When Herbart discussed pedagogical problems, he showed a degree of familiarity with descriptive psychology which is only inadequately reflected in the abstract system which appears in his books on psychology proper. He undoubtedly did psychology and education the great service of bringing these two sciences into closer relation to each other, but he made no vital contribution to the science of psychology itself, except as he promoted the general descriptive movement and added enthusiasm for scientific method.

Present-day American psychology owes much to German influences. Wundt has trained many of the leading Americans now at work in this field. One American psychologist who deserves to be mentioned as a leading contributor to the modern sciences is William James (*q.v.*). In 1890 there appeared two large vloumes entitled *Principles of Psychology* from this writer, which contained new and stimulating discussions of habit, emotion, instinct, and various phases of sense perception and thought. So stimulating are the general discussions by James that he must be recognized as the leading influence in current American psychological discussions. His emphasis upon activity as one of the major conditions of mental development, his conceptions of the nature of emotion and habit, are among the leading doctrines which he contributed to education. His small volume, *Talks to Teachers on Psychology*, has had a very wide recognition, and lays great stress upon behavior as the fundamental conception in any treatment of educational psychology.

A movement which at one time promised to be of the greatest importance in educational psychology was the Child Study movement, largely initiated by G. Stanley Hall. (See CHILD STUDY and PSYCHOLOGY, GENETIC.) This movement lacked for the most part in definite guiding principles, and while it led to the collection of a large amount of material with regard to children's habits and activities, it has never developed into a system of educational psychology. It does not, at the present time, give promise of any separate existence as a branch of psychology. The current tendency is to work out the problems of education by experimentation and description, and to subordinate educational psychology to the general science.

Numerous efforts have been made to epitomize psychology for the use of teachers, or to make special applications of certain leading principles. The general literature of psychology can be found in the *Psychological Index* published annually by the *Psychological Review*. This reports both the general treatises and the special articles on all of the subjects of this science. The system of classification adopted in the index is one in general use in European publications as well as in this American publication.

The science of psychology may be subdivided in a great variety of ways. Practical interests dictate the separation of animal studies from the studies of human consciousness and human behavior. Further practical motives have emphasized the importance of child study as distinguished from the study of adult consciousness. The result is the appearance of works on animal mental life, child mental life, and adult human life. Abnormality of all sorts is studied in the special subdivision of psychology known as psychiatry. Many of the special social sciences seek a psychological foundation. Thus, there may very properly be an introductory psychological chapter to all studies of language and studies of art. The special psychology of observation as bearing upon the validity of legal evidences is another special topic which has led to a natural subdivision of general psychology. Any social study may, therefore, lead to a subdivision of the subject matter of the science of psychology. The general principles of all social organization may also be brought together under social psychology (*q.v.*).

The methods of psychology suggest another line of cleavage. Genetic psychology is that phase of the science which deals primarily with mental development and evolution. Experimental psychology, on the other hand, is that phase of the science which elaborates the experimental technique. Experimental psychology studies especially such matters as the rapidity and character of reactions (see REACTION TIME EXPERIMENTS), and various forms of perception (see PERCEPTION, SPACE, TIME) and memory (*q.v.*). These topics obviously would be held apart if practical interests were consulted, but from the point of view of methodology they are brought together as capable of experimental attack. Descriptive and explanatory psychology are contrasted with genetic psychology and experimental psychology, as types of psychology depending upon the special methods implied in the two names.

The phase of psychology which is most likely to be of interest to educators has usually been designated as educational psychology, and is discussed in a subsequent section.

Genetic Psychology. — That branch of psychology in which mental development and mental evolution are the chief subjects of treatment. The term has sometimes been used in a restricted sense to cover merely studies of mental development in children. In such a restricted sense, it is the synonym of child study (*q.v.*). In a broader sense, the term should cover animal psychology (*q.v.*) and also those aspects of human psychology which deal with mental change, whether in the child or the adult. The discussion of mental evolution involves the consideration of the nervous system and its evolution. The term genetic psychology may, therefore, very properly cover studies of nervous evolution and development. (See GENETIC METHOD.)

The first and most general problem of genetic psychology is to determine whether mental processes differ from each other qualitatively or merely quantitatively. Thus, is human consciousness of the same type as animal consciousness, merely differing in the number of elements and experiences involved, or is there a fundamental difference in type? The latter is undoubtedly the popular view. Man is said to have reason and abstract intelligence, while the animals lack these higher powers. Descartes, as an early exponent of this view, asserts that animals are pure mechanical automata. The bodies of animals are animated, but soulless. Man, on the other hand, has a rational soul, and hence is different from animals. With the rise of the evolutionary doctrine, such a view as that of Descartes became very difficult to accept. The animals have nervous structures like our own, and they have sensory experiences like our own; they seem to learn by experience and to readjust their activities through contact with the world. It being also in keeping with the general spirit of the evolutionary doctrine to seek continuity in the world, there has been of late a strong tendency to break away from the view of Descartes and the common man, and to assert that human consciousness is of the same type as animal consciousness except that it is more elaborate. A notable exposition of this view is to be found in the work of Ribot (*Evolution of General Ideas*, Chicago, 1899), in which it is held that the germs of all of the higher forms of abstraction are present in the animal perception.

Wundt's position in the matter is set forth in the *Outlines of Psychology* (p. 313) as follows: "If we try to answer the general question of the *genetic relation of man to the animals* on the ground of a comparison of their psychical attributes, it must be admitted . . . that it is possible that human consciousness has developed from a lower form of animal consciousness. . . . Still, we must not overlook the fact that between the *psychical* attributes of man and those of the animals . . . there are differences much broader than the differences in their physical characteristics."

There can be no doubt that biological continuity of animal evolution has been fully established on the physical side. There can be no doubt also that there are common elements of mental life in animals and men. Whether the evolutionary relations of consciousness are best set forth by emphasizing continuity may be doubted. Before the doctrine of evolution was formulated there was need of attention to the relationship between man and the animals. The problem now before science is the problem of explaining how man has come to be so different from the brutes. Man has eyes and ears like the animals, but he has a totally different set of ideas and hopes. Man is a creature of ideas, of language, and inventions. He has turned into a new path of evolution, and this new path is the most interesting subject which science has to take up in its study of man. Hobhouse, in his *Mind in Evolution*, has drawn attention to the principle that evolution becomes progressive in the degree in which it brings mental adaptation to the front and substitutes this for purely natural selective change.

The general evolutionary problem outlined above resolves itself into a number of minor problems. Thus we are led to inquire what are the instincts (*q.v.*), and what their origin? What is the relation of instinct to habit (*q.v.*)? What is the origin and evolution of language (*q.v.*)? What is the evolution of the arts, of abstract thought, of systems of science, such as number science? For the student of education, these detailed studies of mental evolution are more directly applicable to the problems of the school than the more general discussion of evolutionary principles. Indeed, the problems may very profitably be subdivided still further. Within the general problem of the development of language, two separate problems, one relating to writing, and one relating to reading, may be worked out with a direct view to answering many of the practical questions of school organization and instruction. This is not the place to summarize in detail the results of such genetic studies, but in order to illustrate further the genetic method, certain general results of such studies may properly be presented.

Mental development does not go forward at a uniform rate; sometimes it is rapid, and at other times it is slow. Thus, one acquires words in learning a foreign language at first very rapidly, and later at a much slower rate. In learning to make a movement, one often improves at first very rapidly, later, more slowly. In mastering certain systems of scientific thought, one progresses at first slowly, until a few fundamentals are mastered, whereupon later progress is more rapid. These examples serve to make clear the necessity of a more complete examination of all the types of mental development with which the school has to deal. If the parts of arithmetic where rapid progress is usually made could be sharply contrasted with the phases of arithmetic in which progress is slow, then school work could be more economically organized.

A second principle of genetic psychology may be formulated as follows: there are certain hierarchies or levels of mental activity. Before one of the higher types of activity can be perfected, the elementary activities entering into it must be perfected (see LEARNING). Thus mathematical manipulations involve certain elementary processes, such as addition, subtraction, etc. The mastery to some degree of the elementary processes is essential to the perfect development of the higher process. Here, again, there is a rich field for educational research. It is not obvious in certain types of mental activity, as, for example, reading, what are the lower elements. It was assumed at one time that the letters must be completely mastered in order that one might read fluently. To-day there is much skepticism as to the necessity of learning the alphabet as a preliminary to learning to read. It is a problem of genetic psychology to study reading until the elementary phases of reading can be defined.

A third position which has been stoutly defended in genetic psychology is that which holds that activity is at once the goal and the motive of all mental development. The psychology which existed before the evolutionary doctrine was advanced, described mental life very largely from the point of view of adult introspection. In the adult mind, those experiences are most obvious which arise through meditation and comparison of ideas. The result was that mental life was treated for the most part as an aggregate of ideas and forms of meditation. As soon as psychology was forced to take up the broad study of all levels of mental activity, it became evident that meditation is not the typical, and certainly not the final, stage of conscious activity. All consciousness, even that of a meditative type, issues in behavior. Hence, genetic psychology has put even the more elaborate forms of mental activity in an entirely new light with respect to their origin and development.

A final principle of genetic study, which is of very general importance to education, may be stated thus. Many processes which are present at lower levels of mental development tend to disappear at higher levels. This may be called the principle of negative education. A good physical analogy appears in the fact that an infant's feet are capable at first of movements closely related to the grasping movements of the hands. Later, by virtue of the changes in the structure and control of the feet, these organs become specialized, and give up their powers of activity as organs of prehension. An example of the same type taken from the sphere of sensory experience is seen in the fact that an infant always seeks to become acquainted with new objects by carrying them to his mouth. Again, he always reaches for bright objects, including the fire. Later, he learns to get his sensory experiences in a more economical way. As a final illustration, one may cite the fact that arithmetical methods are superseded by algebraical. The race has repeatedly given up elaborate methods of thought and procedure in favor of new discoveries. The Roman numerals were given up for the Arabic. These examples suggest the importance of organizing educational processes, so that they shall require as little as possible of abandonment of earlier forms of activity, while at the same time they make it perfectly clear that there must be some negative education.

Functional Psychology. — The term was first brought into prominence by Titchener, who, using the analogy of anatomy and physiology, called attention to the possibility of treating consciousness from either the structural or functional point of view. When one analyzes consciousness into its constituent elements, as, for example, when one analyzes his consciousness of a book into sensations of black, white, color from the background, shadows, etc., the interest is primarily in the structure of mental life. When, on the other hand, leaving this minute analysis, one inquires how a certain conscious state will affect the future behavior of the individual, he is considering the way in which consciousness operates, or its functions. Titchener, in his discussion of the matter, points out that analytical study is purely scientific in its interests and results. Analysis lays the foundation for applications, but is not itself practical. If we are to have applied psychology, we must go beyond analysis and understand functional relations. Functional study is, however, a late product in any science, and must, according to Titchener's view, wait upon the completion of structural analysis.

There can be no doubt that Titchener is right in his position that education is in need of a functional psychology before the practical problems of the schoolroom can be solved psychologically. Thus, to take a concrete case: the child who is learning to write has a complex conscious experience into which enter such elements as the following: visual sensations from copy, blank paper, sight of fingers, pen and general surroundings; auditory sensations from the teacher; tactual sensations from his hand and arm; muscle sensations from his fingers, hand, and arm; a mass of bodily sensations; an admixture of feelings, desires, and resolutions. To analyze the child's mental complex into these elements is undoubtedly legitimate scientific procedure. The teacher is left, however, at the end of the analysis with very little practical assistance. Suppose, by way of contrast, we dwell upon the fact that the best way for the child to write is to begin with a study of the visual pattern, and that later some rapid writing will force him to become fluent, if not exact, in his execution; we are dwelling upon principles of behavior rather than upon analyses of structure. Principles of behavior are very often much less exact than the results of analysis, and the explanation of behavior is often much less complete than the statement of the cause of a structural element of consciousness.

If the elements of consciousness are its important factors, then we are grossly neglectful in our common disregard of taste and odors. Indeed, some structuralists have seriously argued that schools should introduce exercises which will train children's noses. Are not the odors which come to us as numerous and varied in quality as our other sensations? Let us cultivate the power of dwelling upon them. To the functionalist, this is absurd. The sensory element is of value only when it guides in behavior. The odors which come to the human nose are of relatively little value as compared with the visual sensations which come to the eye, when behavior is under consideration. Therefore, the functionalist faces with perfect equanimity the common neglect of odors, and the great emphasis upon vision. What is the functional value of an impression? is the functionalist's question. What is the impression? is the structuralist's question.

There can be very little doubt in the mind of the partisan functionalist that one of the reasons why teachers have learned so little from psychology is that this science has been predominantly structural in its interests. The analysis of consciousness into its elements has very little connection with the practical work of guiding mental development. In contrast with mere structural studies, the work of such a writer as James is broad in its interests and illuminating for the educator, as well as for the student of technical psychology.

C. H. J.

Structural Psychology. — "The contrast is really between two *aspects*, in which all mental facts without exception may be taken; their structural aspect, as being subjective, and their functional aspect, as being cognitives. In the former aspect, the highest as well as the lowest is a feeling, a peculiarly tinged segment of the stream. This tingeing is its sensitive body, the *wie ihm zu Muthe ist*, the way it feels whilst passing. In the latter aspect, the lowest mental fact as well as the highest grasps some bit of universal truth as its content, even though that truth were as relationless a matter as a bare unlocalized and undated quality of pain. From the cognitive point of view, all mental facts are intellections. From the subjective point of view, all are feelings." These sentences, which were written by James in 1884, and in which, so far as the writer is aware, the two "aspects" of mind first receive their current titles, may serve as text for a discussion of structural psychology, and of its relation to other departments of psychological work.

In commenting upon them, we remark (1) that James identifies functional with cognitive psychology: the restriction, however, seems to be due to context and not to deliberate purpose. Structural psychology is, in fact, to be distinguished, on the one hand, from any form of psychology which posits and exploits intrinsic mental function, whether cognitive, intentional, or other; and, on the other hand, from any form of psychology which attributes to mind an extrinsic function, such as that of organic adaptation, of the resolution of "nervous tension," and so forth. For structural psychology, mind does not "act"; it exists in time, or "goes on."

We remark also (2) that the phrases "sensitive body," "the way the mental fact feels whilst passing," are, as they stand, ambiguous. For structural psychology is far removed from a mere phenomenology that should take consciousness, so to say, at its face value. The task of structural psychology is exact description; and description implies analysis and synthesis; the passing experience is held up, repeated, cleared of entanglements, in order that its elementary components may be teased out, and the pattern of their arrangement noted. A distrust of conscious appearances, and a systematic recourse to experimental methods, thus mark off structural psychology from the "pure psychology" of an earlier day.

In sum, then, structural psychology tries to give an exact description of mind *sub specie existentiæ*, in contradistinction to psychologies which endow mind with objective reference or which regard it as instrumental. The sources of error are of two kinds, external and internal. (1) Structural psychology is closely related on the one hand to functional psychology, and on the other to psychophysics; and there is danger that the results of the neighboring sciences are uncritically accepted. It is all too easy, *e.g.*, to translate a function, or the phase of a function, forthwith into structural terms; and since functional psychology is itself poised between logic (or theory of knowledge) and biology, and sometimes loses its proper balance, a psychology of structure may be affected, indirectly, by these remoter influences. It is tempting, again, to include in structural psychology facts that in strictness belong to psychophysics, such as the stimulus and differential limens; and if in this case the outcome is less disastrous, the error, in the interest of clear thinking, is no less to be avoided. (2) The internal sources of error are, in the main, of a methodological sort. The method of structural psychology is, of course, direct observation, *i.e.* introspection; and until we know the mechanism of introspection, its scope, limits, pitfalls, conditions, and what not, we cannot be sure of the reliability of our results. In certain fields, as in that of sense perception, the mechanism of introspection is fairly well understood; in others, however, there is still a wide difference of opinion as to precisely what is done when the method is employed. The question is now under debate, and its clear formulation is the best guarantee of a satisfactory answer.

If, as Ebbinghaus has done, we seek an analogy to psychology in the sciences of life, we may say that structural psychology corresponds to gross and fine anatomy, only that it is an anatomy of living, not of dead tissue. Its *raison d'être* is that of exact description in science at large; and its relative importance will, therefore, be variously estimated according as the individual psychologist lays stress upon description, upon causal explanation, or upon teleological interpretation. For the rest, structural psychology is not incompatible with any other department of mental science. Genetic psychology, *e.g.*, may be either functional or structural, and should rightly be both. Functional psychology stands to structural as physiology stands to morphology; there is no reason for antagonism between them. Structural psychology, again, may seek its explanations in physiology, or in the subconscious, without violation of principle. Indeed, the accepted results of structural psychology are, as all students of psychology know, turned to the most varied account in current psychological systems. E. B. T.

Teaching of Psychology. — *In American Universities.* — University courses are usually divided into three grades: (1) an elementary course, (2) special lecture and laboratory courses, and (3) training in research.

The elementary course is ordinarily given in the sophomore year and runs from three to six semester hours. It is one of the most favorite electives. There are two tendencies in mode of approach; namely, the *structural* and the *functional* (*q.v.*); but usually the two methods are combined. The so-called self-psychology (*e.g.* Calkins') has been advocated as a third mode of approach. Lectures, textbooks, and experimental methods are usually combined. The lectures are, as a rule, not primarily informational, but serve rather as a guide and stimulus to the student in obtaining information from other sources. The textbook, though freely employed, is seldom used as the basis for oral recitation. The experimental work takes three forms: (*a*) the demonstration lecture, (*b*) individual experiments without technical apparatus, and (*c*) "class experiments." The tendency in the best teaching is to reduce the demonstration lectures to a minimum on the ground that they do not cultivate self-expression in the student. The attempt to take the student into the technical laboratory for elementary instruction has failed, mainly because the student is confronted with two problems, the apparatus problem and the psychological problem, and the former usually proves too much of a distraction. The beginner's energies must be conserved for the grasping of the psychological problem by itself. The individual experiment conducted outside of the laboratory by such simple means as may be readily available saves the manifolding of elaborate laboratory equipment, frees the student from concern about difficulties in the manipulation of complicated apparatus, conserves his energy for the grasping of the psychological problem, and saves time. The following requirements are typical: Secure the following conditions: (1) make the experiment intensive, — "one thing well"; (2) use only such apparatus as may be at the disposal of the student, or can be supplied freely by the instructor, *e.g.* paper, pins, cards, corks, watches, etc.; (3) supply full and specific directions with the necessary preliminary statements for orientation; and (4) follow each set in the experiment with printed explanation, interpretation, further suggestions, etc. These experiments may be conducted both as class exercises and home assignments; preferably, both combined.

The American Psychological Association has appointed a committee for the purpose of developing and publishing, on some coöperative plan, a series of class experiments which shall comply essentially with the following principles: (1) every individual student shall take an active and responsible part in the experiment; (2) the experiment shall be sufficiently intensive to make it vital; and (3) each step in the experiment shall be explained and interpreted in print.

The technical laboratory course is usually offered only to those who intend to do more advanced work in psychology. It is rather a course in training for research. Advanced lectures and seminar courses are given for intensive treatment of some sections of the subject from some limited point of view. Among the commonest courses are comparative psychology, child psychology, folk psychology, social psychology, psychology of religion, psychology of conduct, and history of psychology.

In the advanced work in psychology, as a rule, very little class work is given to students, who devote their time largely to a research problem. While the doctor's thesis frequently contains a real contribution to knowledge, that work is generally regarded as training for research.

What has been said of the first two groups of courses applies to colleges as well as to the liberal arts course in the university.

In the Secondary Schools. — Although psychology as a science is not naturally a high school subject, it is taught in many high schools and academies. At present the situation is very unsatisfactory because the curriculum is too crowded, there are no suitable textbooks for this grade, as a rule the teachers are not adequately prepared, and a wrong notion as to the magnitude and nature of the subject prevails. There are signs of a wholesome tendency in the direction of making it a very broad and practical course which may best be called *mental economy*, giving only an outline sketch of mental life as a basis for psychological, ethical, æsthetical, and other *help*, needed by the young adolescent. Such a course is very desirable, particularly for the large mass of students who do not go beyond the high school. In this way much very wholesome information is given without attempting to teach psychology as a science.

C. E. S.

In American Normal Schools. — Reports gathered by the Committee of the American Psychological Association from 100 institutions show that in the typical (or average) institution the teacher of psychology has received college training, has had several years experience in his work, and gives instruction in education or other courses as well as in psychology.

The course in psychology, which combines general and educational psychology, is required and prerequisite for subsequent or concurrent work in education. The class, which will average 107 pupils, meets as one section for forty-five-minute periods, and devotes in all ninety (actual) hours to the work. The content of the course varies widely. It is determined primarily by the textbook in use. In most schools too much time is spent upon the nervous system and sensation, not enough upon habit, the inheritance of capacities, mental deficiency and mental hygiene, retardation and acceleration in mental development, the learning process, and allied topics. The method of presenting psychology is the familiar combination of textbook, recitation, and class discussion, supplemented by outside reading. There are few formal lectures, few demonstrations and few or no experiments performed by the student. Nor is there in the typical institution any psychological or educational laboratory. There may be a few models, charts, or lantern slides of the nervous system, or a few "show-pieces" of apparatus to be demonstrated by the teacher.

This general picture of psychology in the American normal school does not, of course, represent fairly its status in some of the best institutions. But, save in these few schools, the teaching has not kept pace with the modern development of the science, particularly in the fields of experimentation and application. It remains, rather, the traditional psychology of a generation ago, or it has become a simplified reproduction of college psychology, taught with too little regard to the development of insight into the mental processes of children of school age. While psychology, from logic and tradition, has been held essential to normal school training, few institutions have sought to measure its actual contribution to the preparation of the teacher. The normal school teachers have persisted in the use of textbooks of psychology that they themselves condemn, and have failed to utilize the opportunity for observation and experimentation afforded by the practice and model schools at their command. Undoubtedly, the preparation and conduct of a course in psychology suited to the needs of the normal school is difficult, both because of the immaturity and meager stock of information of the student, and because of the pressure put upon the institution to do many things in a short time. These difficulties are recognized and normal school instructors are trying to meet them. It would seem that the institutions of higher grade — "normal colleges" — should lead in the reorganization of the teaching of psychology, and should, furthermore, contribute something to research in applied educational psychology, — a phase of work which is practically nonexistent in the ordinary normal school.

G. M. W.

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PSYCHOLOGY, EDUCATIONAL. — Educational psychology in its widest sense is a study of the laws of mental life applicable to educative processes. It would thus include pertinent facts and principles with their applications derived from general, genetic, social, and individual psychology. From this point of view educational psychology represents merely a selection and organization of psychological data that may be of practical service to the teacher. The range and indefiniteness of the field and the wealth of material from which selection may be made have given rise to great diversity in the character, scope, and content of what is called educational psychology and make impossible even an empirical definition based on what is included under it by teachers of the subject.

An inquiry instituted among the colleges and universities in which educational psychology is taught showed that in most institutions it is given as an undergraduate course with general psychology as a prerequisite; in some it may be taken as a first course in education without general psychology, in others general psychology is followed by genetic psychology or mental development, educational psychology being offered as an advanced course. Under such conditions the character and subject matter of the science will of course vary widely. Six types of courses can be distinguished and are indicative of the varying conceptions of the problem and content of the subject: (1) Principles of teaching based on psychology, in which general psychological conceptions are applied to educational practice. Concrete and practical problems arising in school work are interpreted in the light of psychological principles. (2) Psychology of the various school subjects, — an analysis of the mental processes involved in reading, writing, spelling, arithmetic, etc., with the practical applications to teaching. (3) Selected topics from genetic psychology and child study, with a view to tracing in broad outline normal mental development from childhood to manhood. (4) Selected topics from general psychology which are treated in greater detail than in a general course, with specific application to school practice. This course differs from the first type by the greater emphasis on psychological facts and principles than on their application to the art of instruction. (5) Individual or differential psychology, in which are studied the nature, distribution, correlations, and causes of individual differences and their significance for education. (6) Psychology of learning, — an analysis of the various modes of learning and the factors conditioning the learning process.

This examination raises the question as to whether educational psychology has a distinctive field and a specific problem not covered by other recognized branches of psychology. If education is defined in its simplest terms as the process of bringing an individual from where he is to where he ought to be, its three main problems emerge: (1) Where he ought to be — the ends or aims of education — is the problem of principles of education to be worked out for the various types of schools and curricula and for the various periods into which mental life falls. (2) Where he is — the nature of the individual at every stage of his growth — is the problem of biology, sociology, and psychology, general, genetic, individual, and social. (3) How he is to be brought from where he is to where he ought to be gives the problems of methods of learning, on the one hand, and means and methods of teaching, on the other. Educational psychology seems to be legitimately concerned not with the second problem, but with the third. It is the dynamic psychology of the educative process. Its essential field, hence, is methods of learning, especially during school years and under school conditions.

Educational psychology is, from this point of view, not identical with principles of teaching, — its problem is how to learn, not how to teach, — nor does its problem arise in general or genetic psychology. Psychology is a study of mental processes and their development; educational psychology is a study of the laws and conditions of mental work. Psychology studies the natural activity and development of mind; educational psychology the activity and development of mind when it is definitely directed to the attainment of certain prescribed ends. Systematic, constrained mental performance differs essentially from spontaneous, undirected activity both in its methods and in its results. If the essential characteristics of the educative process are guidance and direction to certain ends, then accuracy in results and economy in securing them are the tests by which the process is to be measured. This involves a systematic study of the processes involved and the most economical and effective methods of acquiring and organizing experience, and in particular the acquisition of the tools of knowledge and the essential experience of the race embodied in the school curriculum. Educational psychology thus has a specific problem distinct from and intermediary between psychology, on the one hand, and the art of teaching, on the other. Methods of learning have been left largely to the instincts of children, and they build up the methods they ultimately come to rely on by trial and error. The adult comes to "know, by experience itself, that it is a marvelous pain, to find out but a short way, by long wandering." The discovery of this "short way" for the purpose of guidance and direction of pupils is the problem of educational psychology.

The sources of a science of this character must be: (1) a general psychological analysis of learning processes from which general principles of learning and consequently of teaching may be derived, (2) an organization of the observations and experiences of educators as to laws of economy in mental work, (3) an application of the results of experimental psychology bearing on educational processes, (4) an experimental study on learning processes in school children under school conditions. Actual school experiments will ultimately be the basis on which educational psychology will rest, if it is to become a science on its own account. Its problems can never be solved by merely taking the results of experimental or other psychology and applying them.

The subject matter of educational psychology, with this dominant point of view, may be indicated either with reference to the different methods and processes of learning with illustrations from and applications to school work or as a psychological analysis of the processes involved in the acquisition of school subjects, or both. An outline of the fields in which psychology has made the most significant contributions to the theory and practice of education and in which the applications to the educational process seem most direct and helpful, is all that can be done in the present stage of development of the science. The basis of learning and the foundation upon which education rests is the native equipment in instincts and impulses. The recognition of this fact and its significance is the notable characteristic of education and psychology during the past two decades. The studies of instincts in animals and children during this time have furnished a wealth of material that is suggestive to the educator. Educational psychology is concerned primarily with the modifiability of instincts and their transformation into habits. The laws governing the acquisition of new stimuli to the various instincts, the elimination of receptiveness to old stimuli, the acquisition of new responses, the suppression of old responses, and the blending of several instincts and their organization with reference to particular objects, still remain to be worked out specifically in usable form. The methods of utilizing or suppressing native tendencies in their application to school situations on a basis of scientific observations or experimental investigations constitute important problems in educational psychology.

The selection from the instinctive and impulsive forms of adjustment and the acquired adjustments to which they give rise is made: (1) by trial and error, (2) by imitation and play, and (3) by the formation of free ideas. The interrelations, applications, and relative values of these methods in acquiring and interpreting experience is the central problem of educational psychology. Definite and specific principles applicable to school practice are still in the making.

The learning activities with which the teacher is mainly concerned may be studied specifically as mental work involved in forming (1) associations between stimuli and mental states — technique and economy in observation; (2) associations between mental states and mental states — technique and economy in memory and association; (3) associations between mental states and acts — technique and economy in acquisition of skill. Notable contributions have been made in these three fields in recent years and have laid a foundation for a psychology of the educative process and an art of study.

The technique and economy in the acquisition of experience directly through perception and observation, the latter defined as systematic, purposive perception with a view to retention, have been systematically studied. The experiments on description, *Merkfähigkeit* and *Aussage*, have shown the great inaccuracies in perception and observation, both in children and in adults, and have led to a reexamination of the processes involved, particularly as applied to objective instruction. The causes of inaccuracy — analyzed into the transformation of mental images, the specialization of memories, the lack of system and purpose in observation, inefficiency or defect in sense organs, narrrowness of the span of attention or of the memory span, suggestibility, lack of motor activity with reference to what is observed, fluidity and fluctuations of attention, lack of supplementary ideas for interpretation, practice, and training, — set specific problems for educational psychology.

The relations of attention and imagery to the learning process are problems that have been studied in their direct bearings on educational processes. Observations by teachers and investigations in the laboratory have thrown light on the conditions in the nature of objects and of the individual that determine attention. The fundamental importance of attention in all processes of mental work makes it a topic of major importance in an educational psychology. Likewise, the significance of imagery and of differences in image types in their bearings on methods of learning and on modes of presentation is of special importance to the teacher.

The experimental study of technique and economy in memory and association in recent years has furnished a body of principles of learning significant for educational theory and practice. While much of the work so far done has been concerned with rote learning, the methods used can be and will be fruitfully applied to logical learning. The definite conclusions on learning by wholes and parts, on distribution of repetitions, on retroactive, generative, and effectual inhibition, on relative values of various modes of presentation, on recall in learning, etc., are replacing vague opinions of learning processes based on untested experience, and are indications of results that may be expected from further studies of the factors involved in the formation of associations and in retention and reproduction.

The study of the technique and economy in the acquisition of motor control and skill have similarly furnished principles of efficiency in the combination and coördination of motor responses and their development in accuracy, rate, and simplicity. The analysis of the processes and factors involved in learning telegraphy, typewriting, shorthand, etc., have given laws of habit formation which require to be tested in their relations to the manual activities of the school.

The effects of practice and the transference of practice, mental fatigue, and individual differences are important general factors that affect the educative process. The transference of training and the conditions under which it may occur in school work, the hygiene of mental work in the schoolroom and with school subjects, and the significance of individual differences in capacity to learn and in rate of learning, and the effects of equal practice on such differences, are the specific problems of educational psychology with reference to these factors. Satisfactory school experiments on transference of training are still lacking. Reliable methods of determining mental fatigue and valid principles of mental hygiene as applied to school activities are yet to be secured. The application of the known facts on the nature, distribution, range, correlations, and causes of individual differences to school problems has not been satisfactorily made.

Educational psychology of school subjects has centered about three problems: (1) a psychological analysis of the processes involved in learning reading, spelling, writing, arithmetic, etc., (2) the discovery on a basis of comparative tests of the relative values of methods of acquisition and presentation, (3) tests of efficiency or results. The experimental analysis of the factors involved in reading by study of eye movements, tachistoscopic studies of the reading field and reading processes, aphasia, fatigue, and hygiene in reading are illustrations of work done on the first problem. Similar studies have been made of processes in spelling, arithmetic, and writing, and in the acquisition of foreign languages. The investigations of the relative values of different methods of teaching spelling or writing are illustrations of the second problem. The devising of scales for the measurement of educational products in handwriting, arithmetic, and English writing are illustrations of the third problem.

Important contributions for education are being made in all of the fields of psychology, and ultimately there will emerge a genuine psychology of education. A demarcation of educational from the other branches of psychology that would be universally assented to cannot now be made. V. A. C. H.

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PSYCHOLOGY OF CHILDREN. — See Adolescence; Child Study.

PSYCHOLOGY OF WRITING. — See Writing, Psychology of.

PSYCHOMETRY. — See Mental Measurements.

PSYCHOPHYSICS. — The term "psychophysics" was coined by Fechner to denote "an exact science of the functional relations, or relations of dependence, between body and mind; more generally, between the bodily and mental, the physical and psychical, world." Natural science, Fechner says, can point to its laws, its methods, its facts; and mental science — psychology and logic — rests, at any rate in good part, upon solid foundations; but the relation of body and mind, of material and mental, has been little more than a topic of philosophical controversy. Yet it should be possible, by a method of concomitant variations, to trace and to quantify the connection of the "physical" of physics and chemistry and the "psychical" of empirical psychology.

Fechner starts out from the simplest and most accessible of "mental states," from sensation. The physical events with which sensation is directly connected are, evidently, "activities in our brain"; and the ultimate aim of psychophysics is accurately to set forth the relations of mind and nervous system; Fechner defines "psychophysical" activities as "physical [*i.e.* nervous] activities which form the vehicle or substrate of the psychical, and accordingly stand in direct functional relation to them." It is, however, impossible to begin outright with this "inner" psychophysics; the brain is not "open to immediate experience"; and we must, therefore, have recourse, in the first instance, to "outer" psychophysics; we must establish the numerical relations of *stimulus* and sensation, in the hope that, as knowledge advances, we may utilize the more superficial results for our more profound purpose. And we must not, of course, be content to stop short with sensation; we must aim at a psychophysics of perception, of feeling, of action, of attention, and so on. The work, Fechner tells us, will not be intrinsically difficult; patience, perseverance, and strict adherence to observed facts, will carry us through; and the outcome of our researches will be valuable, not only for science, but also for a sound philosophy.

Fechner was, to the end, unduly optimistic. When Wundt established the first psychological laboratory, in 1879, Fechner's note of congratulation warned him that, by thus attempting things on the grand scale, he was hurrying psychophysics to a conclusion, and in a few years would have nothing left to investigate. The prophecy turned out to be uninspired; and Fechner's own work, despite his vast range of erudition and his unceasing industry, was mainly confined to the intensity of sensation. In this field he accomplished four things.

First and foremost, we owe to Fechner the comprehensive development and theoretical interpretation of the "measurement methods," as they are called *par excellence*, the metric methods of psychophysics. These methods are modes of accurate procedure for the obtaining of test-values or numerical constants, *i.e.*, to return to a phrase already used, for the quantifying of the psychophysical relation. Fechner's exposition is the basis not only of the later theoretical studies and of our current laboratory methods but also of the simpler procedures of applied psychology (mental tests, etc.). Secondly, we owe to Fechner the concept of the "just noticeable difference," or, as it is now termed, the differential limen, an invaluable instrument of psychological analysis. Thirdly, he undertook a number of investigations, which are important both for their results and also intrinsically, as planned with overt psychophysical purpose and as illustrating the use of psychophysical methods. Fourthly, Fechner gives us the sole correct idea of mental measurement; the idea of laying off a magnitude, *e.g.*, of sensation in units of its own kind, and of standardizing these units by aid of their correlated stimuli.

Unfortunately, he fell at the same time into certain errors, which have not only dimmed the brilliancy of his actual achievement, but have also hindered the advance of the science which he founded. In the first place, Fechner was mistaken in his view of the object of direct mental measurement. Instead of regarding the intensive sense-continuum as a finite stretch or distance, and the separate intensive sensations as points or positions upon it; instead, that is, of seeking to measure sensible intensity in terms of unit-difference or unit-distance upon the intensive scale, he considered the single sensation as a measurable magnitude, a mental quantity, and sought to measure the stronger by making it a multiple of the weaker. A high luster, a loud noise, a strong pressure were for him, as sensed, reducible to so many dull lusters, faint noises, weak pressures. Yet it is clear that the more intensive sensations are, to introspection, as single and simple as the less intensive; a loud tone does not, in any psychological sense, "contain," is not "made up of," a number of weak tones; the loud tone is merely the "kind of tone" that lies high up, and the weak tone the "kind of tone" that lies low down, upon the tonal scale or continuum; and all that measurement can do is to quantify the scale-distance which lies between them. Fechner had himself more than an inkling of the truth, but he allowed the parallelism of stimulus and sensation to mislead him.

In the second place, Fechner assumed that the just noticeable difference of sensation is a psychological magnitude, and that all just noticeable differences, from whatever part of the intensive scale they may be taken, are sensibly equal. He assumed, that is, that the practised observer can "carry in his head" the idea of a just noticeable difference, and that this ideated difference may be used as the unit of direct mental measurement. Now in fact the observer can no more hold to an unchanging just noticeable difference than he can, *e.g.* hold to an exactly reproducible millimeter; his idea will vary with circumstances.

In the third place, Fechner supposed that Weber's Law (*q.v.*) was in the strict sense a psychophysical law, a statement of uniform functional relation between mind and body. This mistake led him to exaggerate the importance of the law, its range of validity, and the accuracy with which it can be formulated; it led, also, to a great deal of not very profitable controversy. Fechner made, however, no error of principle; he was always careful to distinguish between Weber's Law as an illustration of his theory of mental measurement and that theory itself. To identify Fechnerian psychophysics with the study of Weber's Law is to fall into a worse mistake than Fechner was ever guilty of.

It has been necessary to speak thus at length of Fechner's work, because the virtues and the faults of that work have alike exerted a decisive influence upon the development of psychophysics. Fechner made mental measurement possible, and he measured wrongly; he gave us the differential limen, and he misunderstood it; he worked out Weber's Law, and he misinterpreted his results. The positive, in this summary, far outweighs the negative; but the negative has been a real stumblingblock in the path of progress.

What, then, is the present status of "outer" psychophysics? We have, within the Fechnerian lines, a clear understanding of mental measurement, direct and indirect; the metric methods have been rounded off into something like definitive form; and a goodly number of measurements have been made, not only in Fechner's field of sensation, but in many other departments of psychological inquiry. The great majority of these measurements are indirect, so that their full statement is psychophysical; but the fact that, with shift of emphasis, they may be regarded as psychological, shows that the rigorous Fechnerian distinction between the two disciplines is breaking down, — a fact abundantly attested by other evidence. Passing beyond the limits of Fechner's activity, we note that the psychophysical methods are in course of establishment upon a noncommittal mathematical basis; that the same methods have been modified for use in applied psychology and in the study of animal behavior; and that new fields of research — memory, correlation, etc. — have demanded and obtained methods of their own. It is hardly too much to say that practically the whole contents of modern experimental psychology might be claimed, by an extreme Fechnerian, as the extension of an "outer" psychophysics; and it is noteworthy that practically this position is taken in the dedication of Ebbinghaus' *Grundzüge der Psychologie.*

The progress of "inner" psychophysics, of physiological psychology, is less easy to gauge. Our knowledge of the sensory and motor mechanisms of the body and of the various divisions of the nervous system has, no doubt, vastly increased since Fechner's time. It may be doubted, however, whether the increase of physiological knowledge has led to a proportionate advance in psychological theory, to anything more, in fact, than partial and tentative reconstruction. Thus, the more we learn of the organs of sense, the less satisfactory do the traditional "theories" of sensation appear; and the more we learn of the motor mechanisms, the less satisfactory do the older "motor theories" of sense-perception become. This clearing of the ground is, in itself, an advantage, and more has been done than merely to clear the ground; we have von Kries' duplex theory of vision, von Frey's theory of pressure excitation, Stumpf's theory of consonance, — we have revised theories of optical illusion, of space-perception at large, — we have new light on the psychology of reading and of motor skill. At the same time, we have no generally acceptable theories of these things; school is divided from school; if we are on the eve of generalizations, still the generalizations have not yet emerged. And as for physiological psychology proper, the connection of mental states and processes with the functional activity of cerebral and especially of cortical structures, our situation is even worse. The doctrine of localization has a fourfold root in experiment, in pathology, in histology, in embryology; yet it remains to a large extent indeterminate. Much has been expected from the neurone-theory; and it is not difficult, with neurone-chains at different levels, with cell-bodies as nutritive and nerve-fibers as conductive in function, and with the synapses or cell-boundaries as the loci of psychophysical process, to devise schemata of the neural correlates of feeling, attention, association, even of thought. But then these schemata are, after all, inventions; they are expressions of personal opinion rather than syntheses of observed facts; and it is significant that the two most recent theories of attention both account for the vividness of the focal idea, in terms of the hierarchy of neurones, but within these limits in precisely opposite ways. What happens in the brain — topically, electrically, physico-chemically — when that organ is the seat of reproductive tendencies, of determining tendencies, of perseveration, when consciousness is recollective, attentive, imaginative, thoughtful, we simply do not know; we can make certain general statements, and we can avoid certain disproved errors; but our intimate knowledge is *nil.* Here, as before, to be sure, there is no need of pessimism; the great body of detailed studies may, at any instant, flame up into generalization; but, as things are, it cannot be said that Fechner's hopes for "inner" psychophysics have been fulfilled. E. B. T.

See Mental Measurements.

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PSYCHOPATHOLOGY. — A general term, including the study of all abnormal mental conditions (see Abnormal; Derangement, Mental; Insanity). It is principally used in contradistinction to psychiatry (*q.v.*) to indicate an emphasis on the mental or psychological aspect of the disorder, and not the clinical. S. I. F.

PSYCHOSIS. — A term which, within recent years, has been used to designate abnormal mental states, more especially those which are functional, *i.e.* not dependent upon discoverable alterations of the nervous tissues. S. I. F.

PSYCHOTHERAPY. — The treatment of disease (physical or mental) by the use of various methods which act principally upon the mind of the patient. The diseases which are most successfully treated are those of mental origin, *e.g.* psychasthenia (*q.v.*) and hysteria (*q.v.*). The methods of psychotherapy are numerous. The ones most used have been suggestion and persuasion (see Hypnotism), but the cathartic association and the mental reconstruction methods are of wide application. These latter methods are of particular value in the treatment of states of anxiety, of phobias (*q.v.*), of obsessions (*q.v.*), and of other psychasthenic conditions. It has been shown that many of the purely mental disorders have their origin in childhood, and the methods of psychoanalysis and of psychotherapy usually lead to an investigation of the early mental life. See Psychoanalysis. S. I. F.

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PTOLEMY (PTOLEMÆUS), CLAUDIUS (*fl.* 150 A.D.). — Astronomer, mathematician, and geographer, a native of Egypt, who probably resided at Alexandria. As an astronomer he dominated the medieval world until the days of Copernicus, and in geography he became the recognized authority of the Classical Renaissance. The Ptolemaic System of astronomy, based largely on the work of Hipparchus, is contained in the Μεγάλη σύνταξις τῆς ἀστρονομίας, better known by its Arabic name *Almagest.* This work consists of thirteen books, the last five of which contain the essence of the planetary system. The earth is, according to this system, the lowest of the spheres in the center of the universe, and is motionless. Above this are certain zones or heavens, spherical in shape, in each of which a heavenly body revolves around the earth: these are Mercury, Venus, the Sun, Mars, Jupiter, Saturn. This theory of the planets was accepted until it was superseded by the Copernican theory. (See Copernicus.) Another original contribution made by Ptolemy deals with the *evection* of the moon. Ptolemy's geographical treatise was the Γεωγραφικὴ ὑφήγησις, which was long used as a textbook and is interesting historically. Other astronomical and astrological works and a treatise on *Optics* are attributed to Ptolemy, but their genuineness has been questioned.

See Geography, section on *History of the Teaching of*; Maps.

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PUBERTY. — The age between fourteen and sixteen in males and thirteen and fifteen in females, at which the individual reaches sexual maturity. The age of puberty differs in individuals and in different races. It is dependent upon climatic conditions, and upon conditions of nutrition and bodily health. The importance of this period for education has been emphasized in the discussions of adolescence (*q.v.*). C. H. J.

PUBLIC INSTRUCTION, SUPERINTENDENT OF. — See City School Administration.

PUBLIC LIBRARIES AND PUBLIC SCHOOLS. — See Libraries.

PUBLIC SCHOOL AS A SOCIAL CENTER. — See School as a Social Center.

PUBLIC SCHOOL EXTENSION. — See School as a Social Center.

PUBLIC SCHOOL FUNDS. — See School Fund.

PUBLIC SCHOOL PLANT, THE FULL REALIZATION OF. — See School as a Social Center.

PUBLIC SCHOOL SOCIETIES. — A type of educational organization common in the early part of the nineteenth century in the larger cities of the United States. The aim of these societies was to furnish free education to youth of the poorer classes or education at a moderate expense to those somewhat better to do. In this capacity, they formed an important factor in building up the free public school system. In their control, they were sometimes denominational or inter-denominational, sometimes non-religious altogether. In this and other respects they resembled the British and Foreign School Society, except that they were always local. The most important of these societies was in New York City, and is described in the article on the schools system of that city.

PUBLIC SCHOOLS COMMISSION. — See Parliamentary Education Commissions; England, Education in.

PUBLIC SCHOOLS, ENGLISH. — The term Public School became attached during the early decades of the nineteenth century to a group of institutions for higher education selected out of a larger body of endowed schools usually called Grammar Schools (*q.v.*). The majority of these grammar schools looked for their supply of pupils from the immediate neighborhood, and if the 'Master' received pupils to reside with him, these would usually come from the homes of country residents within a few miles. But from early times, long before the Reformation, the wealthier, aristocratic classes had been accustomed to send their sons, especially the younger sons designed for the church or the law, to be trained away from home. Winchester, Shrewsbury, and (later) Rugby in the provinces, and Eton, Harrow, Westminster, Charterhouse, St. Paul's and Merchant Taylors' in or near the metropolis were in greatest repute. Hence the use of the term Public, as distinguished on the one hand from merely local (Grammar) schools, and on the other hand from private institutions for which in the seventeenth and eighteenth centuries the term "academy" had come into use. This last term has now fallen into disuse (except in the case of the famous school at Edinburgh) and schools under private ownership are described simply as "school" or "college" at the discretion of the owner.

The use of the term Public School was emphasized by various inquiries instituted by Government Commissions into educational endowment between 1818 (Brougham's Commission) and 1864 (Taunton Commission). The Public School was clearly recognized as an institution of higher rank than the local Grammar School; indeed, a separate inquiry (Clarendon Commission, 1861) was undertaken to report on the nine schools mentioned above, which were described as Great Public Schools, and the sequel to this inquiry was the Public Schools Act of 1868, regulating the control of seven of these, Merchant Taylors' and St. Paul's being omitted because they had latterly become mainly day schools, being amply filled with London boys residing at home.

These seven schools, however, by no means included all boarding schools to which common repute attached the name "Public." The rapid increase of wealth which accompanied the industrial revolution created an immense number of families (especially in the north of England) able to pay high fees for their sons' education and desirous to place them in institutions where a social environment and culture could be procured similar to that enjoyed by those who frequented the "Great" Public Schools, and the unique influence of Thomas Arnold (*q.v.*) counted for much in impressing upon the leisured class the value of a corporate society highly organized by cultivated schoolmasters. If during the first half of the nineteenth century England had already enjoyed a system of municipal secondary education such as Germany had set on foot, it is probable that the movement in favor of boarding-school education would not have maintained itself so decisively in public favor. But in the absence of any such system, it is not surprising that the tradition which had made these seven old foundations great and famous should be imitated by new foundations. Incidental circumstances aided such enterprises; facility of travel by railway was a great factor. Then England, in comparison with the Continent, had been for two centuries a fairly safe country for boys to travel about in; war had been unknown since the Restoration; the English race is migratory by disposition, and families have always been ready to let younger sons leave home at an early age. Thus a variety of causes contributed to multiplicity of boarding-school establishments between 1840 and 1870. The most successful of these became known throughout England and took rank with the famous seven Public Schools; many others aspired to such a position but had to be satisfied with a humbler fame. They can be grouped into three classes according tp their purpose or origin. First, some local grammar schools successfully followed the example of Rugby; — Uppingham, Sherborne, Sedbergh, Repton, are perhaps the highest in repute. Secondly, entirely new foundations were created, sometimes by the energy of a schoolmaster, sometimes by a few laymen who desired to have a fine school established in their district. In this group, Marlborough, Clifton, Bradfield, Rossall, may be mentioned. Finally, a school would be started with a specific bias, *e.g.* to prepare for some profession: thus Osborne and Dartmouth prepared only for the navy, Wellington largely for the army, while Haileybury at first had a close connection with India. Or, still more important, the foundation would combine the advantages of "public school" training with religious oversight more specific than the connection with the Established Church of England which, as a matter of historical social conformity, is inevitably found in the ordinary Public School. Thus Lancing is High Church, Stonyhurst is Roman Catholic, The Leys (Cambridge) is Methodist, and Mill Hill is a Congregational foundation. It should be repeated that for every school in each of these classes which has succeeded in establishing its claim to be ranked as a Public School there are dozens which have had aspirations in the same direction, but have to be content with receiving pupils who pay lower fees, and hence cannot command the same resources as their more distinguished rivals. Such schools often imitate with success the best qualities of corporate life which are the distinctive boast of Public School tradition, but in attempting a classification they can be best grouped as secondary boarding schools. We are now familiar in England with the term secondary as including all types of schooling between elementary on the one hand and college or university on the other, but this phraseology was not familiar to English teachers until all these classes of Public Schools had been well established in national esteem. Matthew Arnold (*q.v.*) was the first educationist to press on English attention (after the example of France and Germany) the importance of secondary schooling as something more comprehensive than anything implied by Grammar or Public School education, but it was only after the labors of the Bryce Commission on Secondary Education (1895) that the popular imagination in England was really attracted to the importance of an extended period of schooling, important for the democracy as well as for the governing and directing classes, in whose interest the Public School and its imitators are designed. Thus, if one desires to view the entire scheme of English school provision, one must place at opposite poles two institutions, to each of which the term "Public" is to be applied. The public elementary schools are local, state controlled and state supported, open to all without fee (with slight exception), ranging from infancy to fourteen years of age, limited to the subject of elementary instruction and taught by teachers certificated by the Board of Education. The Public Schools are non-local and boarding (although a few, such as Clifton, welcome day pupils also); they are neither state controlled nor state supported; they are open to all but only on payment of heavy (sometimes extravagant) fees; they receive pupils from the ages of fourteen (or thirteen) to nineteen, and they impart a secondary curriculum, directed in the later years for vocational training of various types; their teachers are recruited almost wholly from the two ancient universities and a proportion of these (steadily decreasing) are in Holy Orders, *i.e.* are ordained clergymen of the Established Church of England. It will be readily understood how pointedly the contrast between the public elementary school and the Public School is felt in English national life; the schoolboy and his teachers in each of these institutions bear the distinctive hallmarks of their class and carry with them through life the sympathies and prejudices of their early environment.

The unique quality of the Public School is to be found not in its curriculum, but in the organization of its community life. As regards the curriculum, progress has followed much the same course as may be witnessed in other European countries and in America; the old institutions are conservative, but even they give due place to modern studies and spend their resources freely in equipping laboratories, museums, etc., as well as play fields. Latin and Greek of course hold pride of place, but not more so than in Germany. But whereas in Germany distinctive types of curricula are relegated to distinct schools, the English plan is to comprehend all reasonable proposals for vocational training in one school, dividing up the scholars into so-called "sides" as, *e.g.* the Classical Side, the Modern Side, or the Engineering Side. The only distinction between the Public School and other secondary schools as regards teaching is that the former, by its more ample financial resources, can provide greater variety of avenues for vocational equipment; but schools which are poorer in wealth often counterbalance this disadvantage by greater professional skill. Since the reforms consequent on the Bryce Commission the ordinary grammar and municipal secondary schools have greatly improved the caliber of their teaching force and are gaining steadily in popular favor on this account at the expense of their wealthier rivals.

What then is the essential feature of corporate life which is the peculiar boast of the English Public School? It is in reality a social organization of the community specifically adapted to the needs of youth in the earlier years of adolescence. A public school boy is a member of two groups: while at lessons he belongs to his class, called a form (*q.v.*). and he usually remains with his classmates in that group for at most one year; teachers and scholars both are regrouped at very short intervals. But when released from lessons he belongs to a "house"—*i.e.* a building where he sleeps and has his meals, to which he belongs during all the years he attends the school; here he finds his special friends; as a youngster he is a "fag" (see FAGGING), when he reaches the VI form he has authority as monitor or prefect. His house is his special pride; his housemaster is or should be a grown-up friend. The very exclusiveness of this society, where each house is a rival to the others, where every master is personally interested in his young charges, draws out the most intense social energies of the boys, supplying under control an outlet for activities which in the United States have given great concern at times when displayed in high school fraternities (*q.v.*). Naturally the house community have found in athletics (*q.v.*) a strong bond of union ever since the days when "Tom Brown" captained his School House on the 'close' of Rugby. But it would be unjust to describe the house system as merely an athletic organization; all kinds of social activity, in musical and debating clubs for example, fall readily into this social plan. The system was not invented *ad hoc*; it grew up from natural conditions: Arnold and others of his time saw its psychological worth as providing the schoolboy both with personal oversight and with means for individual expression such as the large crowd of the entire school assembly could not offer. The best evidence of the value of the system is proved not only by its adoption in all types of secondary boarding schools, but by the transference of the same idea to secondary day schools. During the last twenty years, many of these schools have adopted the "house" principle, although the pupils reside at home. The entire community of teachers and pupils is divided into permanent groups of not more than fifty. When a pupil enters the school he is allotted not only to a form for lessons, but to membership in a House; if older brothers have preceded him, he will join the same house to which they belong; if not, he is assigned to a house community on some plan of geographical distribution or other local arrangement; the house, here as in the boarding school, provides him with a small circle of associates throughout his school life. This plan was first tried at Clifton, a Public School which has about one-third day pupils on its school roll. From Clifton it spread to many schools which have no house for boarders, but receive only day pupils.

We have noted above that the Public School usually limits the entrance age of its pupils to thirteen or fourteen; in one or two cases — Clifton is again an example — a junior department is maintained for little boys, but usually boys under thirteen are sent by their parents, often at the age of nine, to private schools which have grown up under the shadow of the Public Schools and are known by the distinctive title of Preparatory Schools; the most prosperous reach in numbers to 100; others receive only twenty or thirty little boys. The owners of these schools have almost always been teachers in a Public School, and give close individual attention to the youngsters, being careful to ground them diligently in the rudiments, so that they may successfully pass the written examination which each Public School conducts before a pupil is admitted. These examinations are often a pretty severe test of knowledge, for there is great competition to secure a place in a famous Public School, especially in times when trade is good and wealth abundant. The Public School endeavors to be select not only in the social and material status of its clientèle, but by rejecting so far as possible scholars of low intellectual caliber; hence the important rôle played by the Preparatory Schools, of which some hundreds are in existence at present; they have formed a professional organization and publish a journal of good standing. The headmasters of the Public Schools have also organized a sort of association called the Headmasters' Conference, founded by Thring (*q.v.*), but each of them is too much of an autocrat in his own sphere to be prepared for any large measure of coöperative activity, and they usually hold aloof from any form of state inspection or control. Indeed, there is probably no position in English civic life where a single individual exercises such uncontrolled power over others as does the head of a successful Public School; the governing bodies leave him a free hand, knowing that laymen can scarcely interfere with prudence in the details of an adolescent society; the assistants are, of course, often consulted, and a wise headmaster relies on their judgment, but officially they have no status other than that of assistants to their chief; tradition, however, is a potent force in checking possible excesses of authority, and it is rare that discontent with the system finds public expression. This traditional habit is further fostered by the common training which all the masters, heads, and assistants have received. More than 90 per cent of these masters come from Oxford or Cambridge; a graduate of the newer universities can scarcely intrude into this select academic society. These two universities also maintain connection with the Public Schools by a joint board (*q.v.*) for conducting university entrance examinations and by an elaborate system of valuable scholarships offered by all the colleges at Oxford and Cambridge (*qq.v.*) The reputation of a Public School is largely gauged by its successes in winning entrance scholarships, and the winners' names are published in the daily press.

It will be seen that the Public School is quite a distinctive English product. The pupils have not only increased, as we have seen, in proportion to the growth of the country in wealth and in social ambitions, but they have found their special métier in the extraordinary demand for men of ability and leadership which characterized the expansion of the British Empire through the nineteenth century. India and all the Crown colonies are practically governed by Public School alumni, and the government departments in London as well as the army are almost wholly staffed from the same source. The growth of the democracy has naturally tended to challenge this dominance, and at the present moment the claims of men bred in elementary or municipal schools are being hotly contested. It is certainly a misfortune that this system of schooling should have emphasized the cleavage that exists between municipal life in our great cities and the imperial interests which center at Whitehall. As a distinctively English growth, the system has hardly found a foothold in Ireland, and Irish parents who wish their sons to gain its advantages send them across the channel to an English school. In Scotland, however, a few schools after the English pattern, such as Fettes, Loretto, Merchiston and Glenalmond, have gained a high reputation. And, since the governing ideas of the system are specially adapted to boys, few efforts have been made to adapt the organization to the needs of the other sex: the important developments since 1860 for the higher education of girls and women have taken a different course. J. J. F.

See ARNOLD, THOMAS; BRADLEY, G. G.; HAWTREY; KENNEDY; TEMPLE; THRING; VAUGHAN; ETON; HARROW; RUGBY, etc.; BOARDING SCHOOLS; DORMITORIES; ATHLETICS IN ENGLAND; FAGGING; STUDENT LIFE, etc.

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PUBLIC SCHOOLS, SYSTEM OF FREE. — See Free School; National Systems of Education.

PUBLIC SERVICE, EDUCATION FOR. — *England.* — With a few exceptions all appointments in the Civil Service are filled by competitive examination. This system was first introduced in connection with the Indian Civil Service. When the charter of the East India Company lapsed in 1854, a special commission under Lord Macaulay recommended the introduction of open competition to select civil servants for India. In 1855 a Civil Service Commission was appointed by an Order in Council. For the home service political nomination was not abolished, but qualifying examinations were conducted by the Civil Service Commissioners. The principle of open competition was not introduced for the home departments until 1870, and this still prevails. It is to be noted, then, that no attempt is made to give any special training for the different branches of the Service. The chief aim is to secure candidates of intellectual ability and good education rather than technical knowledge. The special training is received in the ordinary course of routine work after the candidates successful in the competitive examinations are appointed. The aim is to make the scheme of examinations "conform so far as possible to the course of established education in the several grades." The Civil Service Commissioners do not desire through the examinations to affect the educational system in any way. Consequently, with few exceptions, no information is issued as to "the course of preparation which candidates should follow or the books they should study." Candidates must be guided by the general requirements for the various branches of the service and the examination papers which are usually published. Much criticism has been levelled of late against the examination system, more particularly in connection with the second class service, but no fruitful suggestions have been made of an alternative which will safeguard the interests of the public and eliminate injustice in the method of selection. It is objected in the main that there is a tendency for candidates to repair to the crammer and to leave the secondary schools at too early an age. But this is probably an element incidental to any system of competition. The principle suggested in 1854 by Macaulay is still followed, that "the examinations should be based on such previous preparation that candidates who fail can without difficulty turn to some other occupation." To take an example from present practice the examination for the Home Civil Service (Clerkships I), the Indian Civil Service, and Eastern Cadetships, the age limits for which are twenty-one to twenty-three for the Indian and twenty-two to twenty-four for the Home and Colonial Services, attracts candidates who have been educated in public or grammar schools of good standing and have then pursued a course at one of the universities. As a general rule, all the candidates are graduates in one or other of the faculties. The majority come from Oxford and Cambridge, followed by those from Edinburgh and Dublin. The following figures will, however, indicate the number of successful candidates who were specially prepared for the examination between the years 1896 and 1900 (the last date for which such statistics were drawn up):

SPECIALLY PREPARED

Not Exceeding 3 months	For more than 3 months	Time not stated	Not specifically prepared
11	232	7	150

Both Oxford and Cambridge give special preparation to candidates for the higher division of the civil services, and this practice is followed in a few of the other universities. The majority, however, proceed to a well-known preparatory establishment in London. Since 1906 the tendency in the higher division examination has been to reduce the number of different subjects taken by each candidate so that the actual university course may now perhaps be sufficient preparation. The competition for places in the Home (Clerkship I) and Indian Civil Service and Eastern Cadetships is severe and there are usually three candidates for each vacancy. The following is a list of subjects from which candidates for Clerkships I, the Indian Civil Service, and Eastern Cadetships may select: English composition and the following languages and literatures: English, Latin, Greek, Sanskrit, Arabic, German, French, Italian; mathematics, lower and advanced; natural science (chemistry, physics, geology, botany, zoology, animal physiology); history (Greek, Roman, English, general modern); logic and psychology; political science; Roman law; English law. The marking of papers is so arranged that a deduction is made in order to secure that a candidate be allowed no credit at all for taking a subject in which he is a mere smatterer. Candidates for the Indian service must pass a second examination at the end of a year in subjects including: Indian Penal Code and Code of Criminal Procedure; a vernacular language; Indian Evidence Act; Hindu or Mohammedan law, Sanskrit, Arabic, Persian, or Burmese.

The competitive examinations for entrance into the Royal Military Institutions indicated, in the years 1896–1900, that 1284 successful candidates came direct from school, while 785 candidates had had private tuition subsequently. But it must be mentioned that most of the large schools have special departments which give preparation for these examinations.

For Second Division Clerkships (age limits eighteen to twenty) which lead to appointments for work of a routine character and involving little administrative responsibility, the subjects of examination include: handwriting, orthography, copying Mss.; arithmetic; English composition; précis; bookkeeping and shorthand; geography and physical history; Latin; German; elementary mathematics; inorganic chemistry and elementary physics. Candidates in the period 1896–1900 had had the following preparation: grammar schools 64.7 per cent; elementary schools 13.5 per cent; higher grade schools 9.2 per cent; and private schools 12.3 per cent. Of 135 candidates 101 had received special preparation.

The examinations for Second Division and other lower branches of the civil service have not reacted favorably on education in general. They have called forth an alarming array of civil service crammers, who attract pupils away from the ordinary secondary schools. Every large town has a number of such establishments which aim at nothing but securing a place for their candidates on the list of successes. Unfortunately there are no statistics bearing on this subject, but as an indication of the possibilities it may be mentioned that the Civil Service Commissioners in the year 1908 dealt with 37,150 cases, *i.e.* candidates for all departments of the civil service. The whole question of examinations and appointment in the civil service is at present being investigated by a specially appointed Civil Service Commission (1912). I. L. K.

United States. — The civil Service system in this country is only gradually recovering from the evil traditions of the "spoils system," introduced early in the nineteenth century. Some measure of reform was introduced in 1883 by the National Civil Law, which introduced competition and probationary service and established a Civil Service Commission. But only about 40 per cent of the civil service appointments fall under the "classified" service to which alone the reforms apply, the "excepted" appointments still being subject in large measure to the old evils. There is practically no institutional preparation for the civil service, or even for the examination for entrance into the civil service. Such preparation awaits the development of a greater permanence and stability of tenure in the various branches of the governmental service as well as a greater differentiation in this service and more definite technical requirements for qualification. There are evidences, however, of a greater appreciation, on the part of the public, of such needs and a growing demand for a broader and more specific training for all branches of public service. An excellent beginning has been made in the preparation of suitable candidates for the foreign and consular service here described.

Educational Preparation for the Consular Service. — In the principal European countries both the diplomatic and consular services have, for a long time past, afforded a definite career, with tenure guaranteed during good behavior, promotion for meritorious service, and usually retirement on a pension. Prior to 1906 neither the diplomatic service nor the consular service of the United States possessed the essential elements of a career; for there was no stability of tenure, and both admission and retention in the service, and to some extent promotion, were dependent upon the measure of political influence possessed.

In 1906, however, great changes were made in the American consular system by the Reorganization Act of April 5, 1906, and the Executive Order of June 27, 1906. Thanks to this legislation and supplementary regulations, the most glaring faults and abuses of the old system have been corrected, and a thorough system of examinations regulating admission into the service has been established; promotions have been based upon relative efficiency shown in actual service, and a reasonable degree of permanence of tenure has been assured.

The entire consular service was reclassified and admission has been restricted to 105 places among the 298 consulates-general and consulates, namely, 60 consulships of Class VIII with a salary of $2500 and 45 consulships of Class IX at $2000. Vacancies arising in any position above these two grades are filled exclusively by promotion based upon meritorious service performed in a lower grade.

The examinations, which are conducted by a board of three, consisting of two officers of the Department of State and the Chief Examiner of the Civil Service Commission, are partly oral and partly written, the two counting equally. The oral examination is useful in determining the candidate's alertness, general information, natural fitness, and address. The written examination includes a modern language — either French, German, or Spanish; international, maritime, and commercial law; political and commercial geography; arithmetic; natural, industrial, and commercial resources and commerce of the United States; political economy; American history, government, and institutions; and modern history (since 1850) of Europe, South America, and the Far East. The successful candidate is required to obtain a general average of at least 80 per cent in the combined examinations. In order to take the examinations, however, candidates must first be designated for appointment subject to examination, and these designations, which take no account of the political affiliations of the candidate, are so made as to secure proportional representation of all the states and territories in the consular service. Similarly all appointments are made in conformity with the same rule.

The establishment by the United States Government of conditions which promise a career for young men in the consular service of the United States has encouraged several prominent universities and colleges in this country to inaugurate and maintain systematic courses of instruction for the training of candidates who are ambitious to enter this field of government service. Two or three enterprising institutions, foreseeing the developments of the last few years, had established, prior to 1906, facilities for fitting young men for the American consular service. Preeminent among these institutions, both as a pioneer and from the viewpoint of thoroughness, is the George Washington University at Washington, which for nearly a decade has offered special facilities for the preparation for government service, both at home and abroad. Since 1906, however, this institution, in its College of the Political Sciences, has maintained courses of study which are more complete and responsive to the subjects required in the government examinations for admission to the consular service than are offered elsewhere. These courses include international trade; commercial policies; resources of the United States; political economy; political and commercial geography; international, maritime, and commercial law; American history, government, and institutions; modern history of Europe, South America and the Far East; modern languages; and highly specialized courses on the consular service itself, including the rights, duties, and methods of procedure of consular officers, origin and development of consular establishments, extraterritorial privileges, etc. The requirement for admission to the College of Political Sciences is the completion of two years, or its equivalent, of satisfactory undergraduate work in any college of good standing. The completion of the courses in the political sciences ordinarily requires two years, and for this work the degree of Bachelor of Arts is conferred. The higher degrees conferred for post-graduate work are Master of Arts (A.M.), Master of Diplomacy (M.Dip.), and Doctor of Philosophy (Ph.D.).

Yale and Columbia universities offer a joint course in preparation for the foreign service, and those who complete it satisfactorily receive a certificate signed by the presidents of the respective universities. The underlying idea in this plan is the desire to avoid the needless duplication of expensive courses in the two universities. Each supplies what the other lacks. Yale is exceptionally strong in geographical and political courses, while Columbia has a wealth of foreign language courses. The joint course is designed to prepare students for practical work in foreign countries, either by entering the service of the United States Government, or in business enterprises, or in missionary or scientific lines. Students who register are expected to have completed successfully at least two years of undergraduate work at a college of good standing, and the preparation for the consular service calls for three years' work and for other foreign service in special fields two years' work. Students are admitted to candidacy for the regular academic degrees under the usual conditions of the two coöperating institutions.

The University of Wisconsin, in its School of Commerce, prepares young men for the consular service and for foreign commerce. It offers a group of studies designed especially for the consular service and pursued during the junior and senior years. These courses embrace modern languages, colonial politics, contemporary international politics, history of diplomacy, international and commercial law, federal administration, and the consular service.

The University of Chicago also advertises courses to prepare men for the consular and foreign commercial service, offering for this purpose courses in the subjects above described, although at this institution the work of training men for the consular service fits in with the general work of the university.

The University of Illinois (Urbana, Ill.) gives a four years' course in commerce and the consular service. The curriculum on the consular service is designed to meet the precise requirements of the consular examination, as already explained.

Harvard University has recently established a Graduate School of Business Administration, which gives all the courses necessary in the preparation for the examinations to enter the consular and insular services of the United States.

The University of Pennsylvania, in its department known as the Wharton School of Finance and Commerce, has for many years maintained courses suitable to fit men for foreign commerce. Very recently a serious effort has been made to adapt these courses to the special requirements of the consular service, with the result that this institution must be included among the best facilities of the country.

The State University of Iowa (Iowa City, Iowa) contains a School of Political and Social Science and Commerce, which aims to train candidates for the diplomatic and consular service and for commercial careers.

The University of California (Berkeley, Cal.) contains a College of Commerce, wherein courses are given which appear to meet all the requirements of the consular examinations.

The University of Minnesota, while containing no separate school or department for training men for the foreign service, offers several courses suitable for preparing men for such service. The same is true of the University of Michigan, Cornell, Leland Stanford, and several other higher institutions of learning.

Recently a carefully devised system of examinations of candidates for appointment as secretaries of embassy or legation of the United States has been put into operation in the Department of State, under the direction of a Board composed of four officers of the Department and the Chief Examiner of the Civil Service Commission. These examinations follow quite closely the plan of the consular examinations. This system for entrance into the diplomatic service, supplemented by the present policy of promoting efficient secretaries of embassy or legation to be heads of mission, furnishes further justification for the establishment of collegiate facilities for systematic and thorough preparation for the foreign service of the United States Government. J. B. O.

See CITIZENSHIP, EDUCATION FOR.

Germany. — While the system in general does not differ in Germany from that of England or France, since it is dependent on competition, the regulations for preparatory training are more rigorous. Thus in Prussia candidates for the lower branches of the civil service must have passed the maturity examination (*Reifeprüfung*) after six years of work in a Gymnasium, Realgymnasium, Oberrealschule, or *höhere Bürgerschule*, or promotion into *Obersekunda* of one of the nine-year secondary schools. A state examination must be passed in addition. The special training is obtained during a probation period of varying duration. For the higher administrative, judicial, and technical positions candidates must in most cases have attended a university or technical institute for at least three years, must pass the academic examination in their respective fields, and then the special state examination.

France. — In no country perhaps are civil service appointments so much sought after as in France. As in England, most of the appointments are dependent upon competitive examinations, while for some, certain prerequisites are imposed, *e.g.* graduation from a secondary school (*bachelier ès lettres*), a law degree (*licencié en droit*), or a doctorate in science or medicine, etc. The training is given after appointment, a period, varying in different offices, being spent as supernumerary, auxiliary, auditor, etc. In only a few branches, mainly technical, military, and naval, does the government maintain special schools, *e.g. École Polytechnique, École Militaire de St. Cyr, École d'État Major, École des Ponts et Chaussées, École des Mines, École Navale, Ecole Normale, École Forestière*, etc.

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PUBLIC TESTS. — See EXAMINATION; SUPERVISION.

PUGET SOUND, UNIVERSITY OF, TACOMA, WASH. — Organized in the year 1903 under the auspices of the Methodist Episcopal Church. The school consists of a college of liberal arts, school of home economics, school of commerce, school of law, school of education, school of public speaking, and schools of music and art, together with an academy and junior academy. The institution has seven and one half acres of land in the heart of the city and seven buildings. The faculty consists of twenty professors and fifteen instructors. The school is coeducational, maintaining literary societies, but no Greek letter fraternities. A six-weeks' summer normal school is conducted. During the school year 1910–1911 the entire enrollment consisted of 498 students, of whom about one fourth were in the College of Liberal Arts, the remainder in the Academy and other schools of the institution. J. C. Z.

PUNCTUALITY. — See SCHOOL MANAGEMENT.

PUNCTUATION. — The general theory dealing with this subject will be found under COMPOSITION, and ENGLISH USAGE. Here only an account of the technical side of the subject is given.

I. The *conventional rules* to be memorized are: (1) the *period* after abbreviations; (2) the *colon* (*a*) at the end of a sentence introducing a long quotation indented as a paragraph, (*b*) before such an enumeration of particulars as requires semicolons between the particulars, (*c*) at the beginning of a letter after a salutation consisting of two or more parts (but usage permits a comma here); (3) *commas* (*a*) to divide series of words without conjunctions, (*b*) before short quotations not indented; (4) points of *exclamation* or *interrogation* standing after a part or after the whole sentence according to whether the part or the whole is exclaimed or asked, and in either case superseding any other punctuation; (5) single marks of *quotation* to indicate a quotation within a quotation; (6) *parentheses*, rarely used except to insert instances in textbooks and reports.

II. The *principles* of punctuation should be taught in strict relation to sentence-structure. Most of the rules of punctuation, and all its difficulties, arise from considerations of sentence-form. In this primary function of indicating syntax, punctuation may be summarized for teaching as follows: (1) The *period* is used to distinguish sentences from clauses. No one can fail to understand this rule; but so many students fail to apply it that there is need of more careful elementary instruction in the distinction on which it is based. (2) The *colon*, except in the conventional uses noted above, is practically obsolete. In older prose it marked a unit midway between a sentence and a clause. In prose of to-day this unit is no longer generally recognized. (3) The *comma*, in general, is omitted or inserted according as a subordinate part is grammatically necessary or not. Omit the comma between parts which are intended to be taken together as one; insert the comma between parts which are not so intended. The principle applies obviously to all parenthetical expressions, *i.e.* to words, phrases, or clauses which are not necessary to complete the syntax of the sentence, and also to adverbial clauses of condition, cause, or exception (introduced by *if*, *because*, *unless*, *though*, etc.) whenever, as is usually the case, these are not intended restrictively. A parenthetical expression has a comma after it, before it, or on each side, merely according to whether it stands at the beginning of the sentence, at the end, or in the midst. (*a*) In particular, a relative clause is or is not set off by a comma according as it is intended to be nonrestrictive or restrictive, *i.e.* grammatically nonessential or grammatically essential, unnecessary or necessary to complete the meaning attached to its antecedent. Frequent violations of this rule in elementary composition show the importance of learning punctuation in relation to syntax. (4) The *semicolon* is generally confined to separating the parts of compound sentences. Its use being generally to indicate that the parts between which it stands are coördinate, it hardly occurs in complex sentences. But not all compound sentences have semicolons. The semicolon is typically used to separate parts which have commas within them; or conversely, when the parts of a sentence have commas within them, these parts have a semicolon between them. The office of the semicolon is thus to distinguish the larger divisions of a sentence from the smaller divisions, the coördinate parts from the subordinate parts. Where there are no commas within the parts, a comma is now generally sufficient between them; but many good writers still prefer a semicolon between the parts of all compound sentences in which the grammatical subject of the second part is different from that of the first. The semicolon is also and more generally used in those balanced compound sentences which dispense with a conjunction; but, except in such careful balances as are unusual with young writers, sentences of this sort had better be avoided. Otherwise there is danger of merely running sentences together by using semicolons instead of periods. (5) The *dash* marks a place where the construction is broken, either interrupted or left incomplete. Therefore it should be used very rarely.

III. Details and exceptions should generally be postponed until the principles are established in a student's practice. Of the many manuals one of the most comprehensive and convenient for the teacher's reference is the *Style Book, a Compilation of Rules Governing Executive, Congressional, and Departmental Printing* (Washington, Government Printing Office, 1911), which includes also many useful tables of abbreviations, capitalization, addresses, signatures, spelling, and proof reading. See also De Vinne, T. L., *Correct Composition* (New York, 1911.), and *Manual of Style*, published by the University of Chicago Press.

C. S. B.

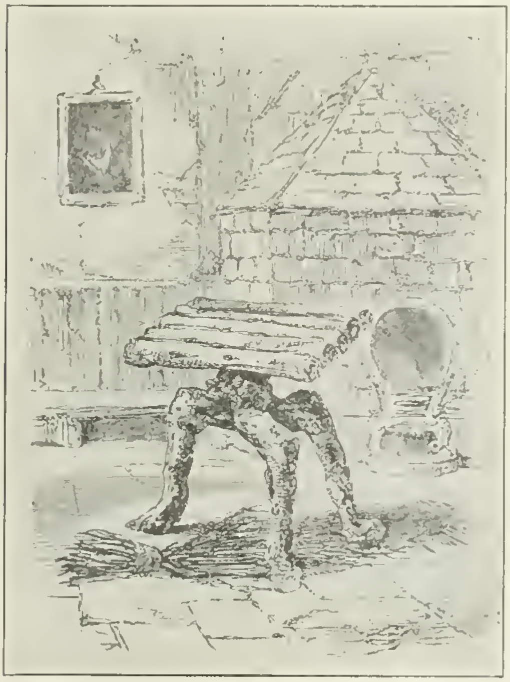
PUNISHMENT, CORPORAL. — History. — *On the Continent.* — Few educational principles have found such general acceptance throughout the world and in every age as the belief in the necessity of corporal punishment as an effective means of training up the young. Solomon's dictum that "he that spareth the rod hateth his son, but he that loves him chastises him betimes" has found many supporters. It was not until a better study of child life and child development were added to the views of a more humanitarian age that the severity of corporal punishment has been relaxed and its gradual elimination strongly advocated. Among the Greeks there is little mention of corporal punishment at Athens, but at Sparta it was employed not only as a means of correction but as a favorite method of hardening the young. The early Romans were especially severe in the training of children. In contrasting the old education with the new as introduced by the Greeks, Plautus refers to the punishments inflicted for unpunctuality and "for a mistake in a single syllable, your skin would be made as spotted as your nurse's gown" (*Bacchides*); the new education was too indulgent. Horace refers to his teacher, Orbilius, as the "thrasher" (*plagosus*). Martial complains of the disturbance caused by the noise of blows from a neighboring school. The instruments of correction used by the Romans have largely become standardized, and deserve some notice. The *scutica* was a strap of leather; the *ferula*, which has had the longest history and the greatest vogue, was a rod; the *flagellum* was of leather in the form of a knot or cat-o'-nine-tails; the *virga* was a switch more nearly corresponding to the birch. The flogging was frequently administered on the bare back. "Horsing" was employed for the better convenience of the teacher. The rod was used for striking the hand (*manum ferulæ subduximus*, Juvenal). Succeeding schoolmasters were unable to do more than refine on these instruments for what may be called traditional corporal punishment. Other instruments of torture were, however, added. Quintilian (*q.v.*) strongly objected to the use of corporal punishment for its degrading tendency and because it was fit only for slaves, and advocated modes of training which are more rational and make an appeal which can be continued when pupils have grown up to manhood. Plutarch in his *Treatise on Education* recommends exhortation and appeal to reason rather than blows and stripes.

The medieval period placed a Biblical sanction on corporal punishment. Flagellation as a means of penance was widely used in and outside of the monasteries. To this practice was added the doctrine of original sin which justified any means for expelling the devil out of children. Flogging became the regular accompaniment of the school. In medieval carvings and pictures the teacher is represented with a switch in his hand. There was little attempt at an adjustment of punishment to crime. And so to be at school and "to be under the rod" became synonymous. Few scholars could boast that they had been through school without being flogged. In some German Latin schools the punishment was inflicted by a special official known as the "blue man" from the fact that he used to wear a blue coat under which he concealed his instrument. Boys were whipped so long as they remained at school, and no discriminations were made as to age. The German schools introduced the whipping blocks and whipping posts to which offenders might be strapped to receive their correction.

With the Reformation no amelioration appeared. Luther insists on the necessity of the strap to prevent acts of insubordination, impudence, and bad training, for children were *childish*, weak, and inexperienced and must be molded. On the whole, however, he recommends moderation and refers to the old days when "children were treated so harshly that they were called martyrs in school." But the Latin schools continued to retain their severity and afforded a vicious example to the rising elementary schools. The school and church ordinances, it is interesting to note, recommended moderation, but ineffectually. Thus the Saxon General Articles (1557), Württemberg Church Ordinance (1559), Lippe Church Ordinances (1571), and the Magdeburg School Ordinance (1553) may be mentioned as examples. And yet the presentation of a rod to a new teacher formed a part of the ceremony of investiture. The type of men who now took to schoolkeeping was not calculated to contribute better methods of maintaining discipline. New forms of torture were added — standing on peas, kneeling on a sharp edge of wood, and the *Spatula* or *Jonathan*. The last was a battledore with a hole in it, used to strike the hand, and was effective in raising blisters. The punishments were in the majority of cases administered in public. It is recorded (see Southey, R. and C. C., *Life of Rev. Andrew Bell*, Vol. II, p. 623) of a Suabian schoolmaster that during his fifty-one years' superintendence of a large school he had given 911,500 canings, 121 floggings, 209,000 custodies, 136,000 tips with the ruler, 102,000 boxes on the ear, and 22,700 tasks by heart. It was further calculated that he had made 700 boys stand on peas, 6000 kneel on a sharp edge of wood, 5000 wear the fool's cap, and 1700 hold the rod above their heads. In the Jesuit schools flogging was employed and a special Prefect of Discipline was intrusted with its administration. It remained for France to introduce in the eighteenth century a form of solemn ceremonial in connection with flogging which was especially employed in fashionable girls' schools. Offending pupils — the triviality of the offense mattered little — were compelled to walk up to the teacher and with a bow ask for the punishment; the rod was brought in

A German School of the Sixteenth Century.

by a servant, the offender was horsed without any regard for modesty, and the correction was inflicted; after which the offender had to kiss the rod and express her gratitude to the teacher. This practice was transported to England and appears in Scotland.



The Whipping Stool of the Litchfield (Eng.) Grammar School.

England. — The history of physical or corporal punishment in England (and so far as pre-Reformation history is concerned the English conditions may be taken as applying to the continent of Europe in so far as it is coincident with the Western Empire) is extremely important as indicating the lines of development of moral education in Western Europe. We may take it as certain that English and Western education directly inherited corporal punishment, as it inherited so many other vital characteristics, from Roman Imperial education. Corporal punishment for boys indeed is one of the few cases in which we can trace back into what may be called Romano-British or educational tradition. In the *Indicium Culparum*, a quasi-criminal code belonging to Wales in the sixth century, the period (550–650) when the Welsh Church and the Welsh principalities appear to have emerged in organic form from their Roman-British origin, the following provision on the subject of corporal punishment for boys occurs: *Si quis parvulus usque ad annos XV quodlibet delictum commiserit, nihil sub judice, nisi disciplinam accipiat; post hanc vero suam ætatem, et quod furabitur restituat.* (See Haddon and Stubbs' *Councils and Ecclesiastical Documents relating to Great Britain and Ireland*, Vol. I, p. 130.) This canon was not restricted to the old British Church. It was at once adopted by the Roman or Papal Church, which came to England with Augustine, and among the excerpts of Egbert, Archbishop of Canterbury (750 A.D.), it takes a similar form. (See *Excerptiones Egberti Arch. Ebor*, 750 A.D., 94. Spelmanni Concilia, Vol. I, p. 267. Ed. 1639.) Thus we find that at any rate from the sixth century corporal punishment was regarded in principle by the rulers of the Church as the proper discipline for boys under fifteen years of age, and we may be sure that the clerical schoolmasters of that date accepted the principle. The common English and French practice in the mid-twelfth century is to be seen in the case of Hugh of Lincoln, who attended a school of the Monastic House of Vellarbenoti near Grenoble at the age of eight years and was flogged continually. The following sentence is significant: *Sic demum infantile flagella padagogi attrectant.* (See *Vita S. Hugonis Lincolniensis*, Rolls Series, p. 8.) A purely English instance occurs a little earlier than this: A master whose children are discovered as "dredynge theyr masyter for fere of correccyon." The poor fellow was punished by Providence; but was cured by the prayers of his grateful pupils at the shrine of St. Ermenylde. (See Bradstow's *Holy Lyfe and History of St. Westburge*: *Chetham Society*, Vol. XV (05), p. 83.) But a more vivid instance of medieval methods than these is to be found in the discipline of the song school at Westminster Abbey in the thirteenth century. The value of these instances is that they show how frequent a part the rod played in the daily life of these little boarders. The rules for the behavior of these boys are happily extant and have recently been edited and printed by the Provost of King's College, Cambridge (Dr. M. R. James), in his volume on *Westminster Manuscripts.* The rules open with a quaint recital to the effect that "whereas it is proper in every way that boys who are *in statu pupillari* should be polite and graced by distinction of manner, it is right that certain things be set before them for their information." Punishment means the rod. When the dormitory arises each boy must say a certain number of prayers "in perfect quiet and order" or he is to be punished. They must make their beds, wash, and go quietly to church under dread of "severe punishment." The rules for good behavior in church are exact: "Let any one who transgresses the above feel a blow with the ferule without delay" or "immediately incur a blow with the ferule." It may be mentioned in passing that there is an illuminated Ms. in the British Museum in which a monk is flogging a boy *in church.* The same rules applied with respect to the return walk to school. If any boy talked English or French instead of Latin (if he knew Latin), he "is to receive a blow for every word." "For every uncouth word or action and for every oath the rod is not to be spared." So, too, if any boy be found with dice in his hands, "he is to feel a blow of the rod on his bare flesh for every pip of the dice." Punishment followed for straying from the school into the town or country and for other offenses: "Whoever at the hour of going to bed upsets the bed of his companions or hides his clothes or throws his shoes or his pillows from one corner of the room to the other or loses his temper or disturbs the dormitory is to be severely punished on the next day." Here, then, we have an excellent instance of the regular use of the rod for the maintenance of discipline and moral conduct and religious observance. But the rod was also used as an incentive to learning. The case of King Henry VI of England is in point: the Privy Council in 1428 authorized his guardian, the Earl of Warwick, to chastise the King (within reason) "for his defaults or trespas, and that for awe thereof he forbere the more to doo mys and intends the more verily to vertue and to lernyng." (See *Privy Council Proceedings*, Vol. III, pp. 297–300, Vol. IV, pp. 132, 136; also Issue Roll, Ed. F. Devon, 1837, p. 407.)

The question is not yet clear about girls. In the small parochial schools, which in the Middle Ages were attended (from the age of five years: see *Calendar of Inquisitions*, Rolls Series, Vol. V, p. 126, *anno* 1310) by both girls and boys, the rod was undoubtedly served out to both, but whether the rod was used in the convent schools is not clear. But probably it was used there for both sexes, as the use of the rod was regarded as a necessary and almost a desirable part of education. It was not until the end of the fifteenth century that any doubt on the subject arose. Then in an English law case (*Yearbook* for 1481–1482, 21 Edw. IV, p. 6) the question is raised if there is any right to strike a child, *quære si un scholemaster peut justifer, car il n'est my prejudice a lui si le scholer ne veut my prend erudition.* Here we find the fifth question as to whether "learning" (as distinguished from "virtue") necessitates the rod. The courts subsequently affirmed the right of the master to punish the scholar, and have reaffirmed the right as recently as last year (1909) and again this year.

America. — The early colonists brought with them the European traditions on the matter of corporal punishment, and it was employed in the schools with little restriction until the middle of the last century. It is interesting, however, to notice in the *Rules for the Ordering of the Town School* of Dorchester (1645) the following statement, "and because the rod of correction is an ordinance of God, necessary sometimes to be dispensed unto children, but such as may easily be abused by overmuch severity and rigour on the one hand and by overmuch indulgence on the other, it is therefore ordered and agreed that the schoolmaster . . . shall have full power for the time being to minister correction . . . without respect of person according as the nature and quality of the offense shall require." At the end of the eighteenth century the *spatula* was in use, and considerable severity was exercised everywhere. By the middle of the last century, to judge by the *Reports* of Horace Mann, a gradual change appeared. In 1841 there seems to have been about an equal division among the schools of Massachusetts which employ corporal punishment and those which do not. A few years later (1846) corporal punishment is used as a last resort, is discouraged, is regarded as an "old theory." Twenty years later (1867) Barnard records the legislation on the question at that time (*American Journal of Education*, Vol. X, 1869). The opinion is very decided that corporal punishment must be used only as a last resort or only by the principal with a written record of the offense.

A Dutch School of the Seventeenth Century.

Views of Educational Theorists. — From the end of the fifteenth century the whole theory of punishment underwent a change. It became the theory of education, and to some extent the practice, to limit the rod to punishment for moral offenses and to cease to use it as a mere habitual stimulus to learning. The educational theorists generally recommend either moderation or elimination. Thus, Erasmus indirectly recommends the abolition of severe punishments. He had the bitter and humiliating experience of being punished to test his disposition. Ascham would like to see a gentle nature in a schoolmaster, although he continues "with the common use of teaching and beating in common schools of England, I will not greatly contend." Locke is opposed to whipping, for "what is beaten into boys excites their repugnance for that very reason;" rather does he recommend a distribution of praise and blame. Montaigne (*q.v.*) (1533–1593) protests with all his might against the use of the rod (*Essais de Michel de Montaigne*, lib. I, cap. 25, p. 134, ed. 1619). While one of the most practical of schoolmasters, Richard Mulcaster (*q.v.*), limits the use of the rod to moral or quasi-moral offenses, "The schoolmaster must therefore have a list made out of school faults, beginning with moral offenses, such as swearing, disobedience, lying, stealing, and bearing false witness, and including also minor breaches of discipline, such as truancy and unpunctuality. To each of these should be apportioned a certain number of stripes, not many, but unchangeable . . . But I do think gentleness and courtesy towards children more needful than beating. I have myself had thousands of pupils passing through my hands whom I never beat, because they needed it not; but if the rod had not been in sight to assure them of punishment if they acted amiss, they might have deserved it." It is, however, by John Amos Comenius (*q.v.*) that there is stated, in a wonderful metaphor, the real objection to mere brutality: "A musician," he says, "does not dash his instrument against a wall, or give it cuffs or blows, because he cannot draw music from it, but continues to apply his skill till he extracts a melody. So by our skill we have to bring the minds of the young into harmony, and to the love of studies, if we are not to make the careless unwilling and the torpid stolid." But Comenius, like Locke, does not absolutely vote for the abolition of corporal punishment. It must be reserved for great offenses. Meantime through the seventeenth and eighteenth centuries the schoolmaster and the tutor as well as the parent used the rod in and out of season without any regard (in the average case) to the advice of the greatest schoolmasters and greatest educational masters of those ages. "The usual lazy short way of chastisement and the rod which is the only instrument of government that tutors generally know, or ever think of, is the most unfit of any to be used in education." (Locke, *Some Thoughts concerning Education*, 1st ed., 1693, 6th ed., 1699, pp. 47, 52.) But it was not the theorist who was to start the new movement, the practical abolition of the rod from the school. The elementary schools founded at Halle in Germany by A. H. Francke (*q.v.*), were at any rate much more humane than the corresponding schools of the period, and in England in the early nineteenth century at Joseph Lancaster's (*q.v.*) Borough Road Institute (*q.v.*) corporal punishment absolutely disappeared despite the fact that the masters and monitors had to deal with children drawn from the poorest classes in the metropolis. (See James Bonwick's *An Octogenarian's Reminiscences*, and J. E. G. de Montmorency's *The Progress of Education in England*, pp. 61–65.) The success that attended the abolition of corporal punishment was, however, secured by methods of ridicule that are on the whole not possible, and it has been found necessary to retain the rod in the public elementary schools for boys, where it is used both by the head master and by his assistants. It is found necessary to give the assistants (so it is said) the power, but in most secondary or grammar schools the power of corporal punishment is reserved to the head master, who frequently canes boys for moral offenses in public and under circumstances that make it disgraceful. Rousseau was of the opinion that punishment should never be inflicted on children except as the natural and necessary consequence of their wrongdoing. In Pestalozzi's schools no punishment was employed. And so in the nineteenth century the humanitarian view combined with the psychological to eradicate very slowly what was for long the bane of every school.

Present Legislative Aspect. — *Germany.* — The legal position of the teacher in German schools with respect to corporal punishment is decided by the Statute Book of the German Empire of May 15, 1871. While it is recognized that the teacher has the right to inflict corporal punishment, this right must be exercised with the moderation expected in parental control. If this limit is exceeded to the injury of the pupil, the teacher lays himself open to imprisonment up to three months or in the case of mitigating circumstances to one day's imprisonment or a fine up to 900 M. ($225). The test whether the limits have been reached is the ability of the pupil to attend school on the day after the punishment was inflicted. The general legislation on the subject is usually further defined by local regulations forbidding any striking on the head or face and pulling ears. In Prussia, by a decree of 1900, a record must be kept of all punishments inflicted by a teacher, and this must be inspected on all occasions when an inspector visits the school. Teachers have the right to inflict punishment on pupils of their class or school not only outside school hours but also beyond the limits of the school premises. In the higher schools corporal punishment is not recognized as a proper form of correction and is limited to the three lower forms. In some provinces of Prussia it is inflicted only after a faculty conference. In every case the teacher must inform the director on the same day that the punishment was inflicted.

England. — On the question of corporal punishment in England there is no legislation. Until recently the right of inflicting it was exercised by every teacher in elementary schools who was regarded as in a position to enjoy the same right as the parent. Within the last few years, largely under the influence of *Suggestions* issued by the Board of Education, the practice has grown up by which local education authorities place the responsibility for corporal punishment and discipline generally on the head teacher, who may decide at his discretion which members of his staff may exercise the right. With this practice has grown up the practice of keeping a record of the punishments inflicted. At the same time there has appeared the tendency to replace the cane or rattan by the Scotch "taws" or leather strap. In the secondary schools corporal punishment is in most cases employed as a last resort and is inflicted by the head master. The cane is the most usual instrument for the purpose. In some schools the parents are informed that their son is to receive punishment, and the cause is given. The teachers of both elementary and secondary schools are subject to common law procedure for assault for any gross violation of due moderation in inflicting punishment, which results in impairment of health or disfigurement.

France. — As in Italy and Belgium corporal punishment is entirely forbidden in all types of schools in France. The rescript for elementary schools was passed in 1887 (Arrêté, Jan. 13, Annexe 20). Bad marks, reprimand, withdrawal of the period of recreation, detention after school, temporary exclusion up to three days, are the penalties which are recognized. Similar provisions were made for secondary schools in 1890 (Arrêté, Juille 5, 1890). The regulation forbidding corporal punishment must be displayed in the elementary schools.

United States. — The tendency to moderate or abandon corporal punishment has already been referred to. In 1906 the regulative principles in cities of 100,000 or over stood as follows, making the classifications somewhat broad. (1) Corporal punishment was entirely forbidden in nine cities (New York, Chicago, Jersey City, Baltimore, Louisville, Ky., Newark, Paterson, N.J., Syracuse, N.Y.). In two others it was retained only to repel violence (St. Paul, Minn.), or in unclassified schools (Cleveland). (2) As a last resort ("must be avoided, if possible," "in extreme cases"), corporal punishment was retained in nineteen cities. (3) No rule, but abandoned by common consent (Philadelphia), and an implicit regulation against corporal punishment is found (Omaha).

Where corporal punishment is retained as a last resort or otherwise, certain restrictions are found to the effect that teachers must keep a record, notify the principal, report to the superintendent, inflict the correction in the presence of others, teachers, principal or superintendent; in some cases the principal or vice-principal alone has the right of administering corporal punishment; in other cases parents must be notified of the intended punishment, and in one case (Kansas City, Mo.) the parents may inflict the punishment instead of the teacher. In St. Louis, Mo., the practice is left to the discretion of the principals without any encouragement by the board of education. Generally the punishment must not be inflicted in the presence of the other pupils or during the school session. In many instances corporal punishment is limited to male pupils, or pupils below high school (Atlanta, Ga., Boston, New Orleans, La., San Francisco, Cal.) or below grammar grades (Providence, R.I.), where specified means are confined to a strap or rattan, and blows must not be administered on the head or face. I. L. K. and J. E. G. de M.

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PUNISHMENT, HYGIENE OF. — First of all the obvious matters in regard to the hygiene of punishment should be mentioned. Severe corporal punishment should never be inflicted; blows on the head, cuffing the ears, severe flogging, standing on one foot or in difficult postures, and the like, and, as a rule, the keeping of children after school to study, the imposing of long tasks like the committing to memory of long passages of literature, the learning or writing of long lists of words, copying the same word 100 times, writing exercises with the left hand, and bizarre and unusual punishments in general, should all be prohibited.

Recent studies have shown the danger of premature or perverted sexual developments as a result of corporal punishment, the danger of developing masochism in the individual punished and sadism in the teacher and other pupils who see the punishment. So many cases have now been reported, that the statement of some hygienists that there is no harm in certain forms of punishment, especially on the posterior parts of the body, seems unpardonable.

Further, the grave results that may come in case of the punishment of nervous and sensitive children have been shown; the danger, for example, of arousing anti-social feelings that may last all through life. Many of the criminals, anarchists, and the like, are thought to owe their hatred of society to unjust punishments in childhood. The study of suicide among children shows that one of the most frequent causes of this is punishment. In the study of 1152 cases of suicide among children, Dr. Eulenberg found the reason assigned in 336 cases was fear of punishment; and reckoning with this, fear of examination and humiliation at lack of promotion, the number was increased to 423, more than a third of the total number.

The danger to the mental health in more subtle ways, by causing worry, sense of shame, a loss of normal self-assertion and courage on the part of sensitive children, and the development of the habit of antagonism, and perhaps in some cases defiance and disregard for law and hatred of society among the stronger minded children, and withal the probability of developing morbid and unwholesome mental habits, suggest the danger of improper punishment to the mental health.

It is of fundamental importance that punishment should be individualized. Extremely nervous and sensitive children should never be punished. Of course the discipline of such children is important, but this should be given in the form of mental regimen or mental therapeutics; in other words, they should be treated as nervous patients requiring special care and attention and special training, and their punishment should come in the form of deprivations or the like imposed upon them in the interest of hygiene or medicine. Again, children of extremely conscientious character and abnormal sense of justice should be punished by a method adapted not only to their faults but to their temperament.

Punishment should be differentiated according to the age and psychological stage of development. With young children, force and corporal punishment, and deprivation of privileges in the way of dainties and the like may be in place; but with adolescents, any form of punishment that impugns the individual's sense of honor and personal freedom is likely to be unwise. The adolescent is unconventional and has a keen sense of honor, although his motives and actions may be very contradictory. Punishment, if possible, in such cases should be the natural result of the fault committed, not a factitious penalty which degrades and humiliates or in any way reflects upon the individual's character or honor as a person, or upon the individual's motives, imputing an intention of wrongdoing.

Among younger children the cruder and more primitive methods of punishment may sometimes be even better than the higher and apparently more civilized forms. A sense of justice and of proper balance between wrongdoing and punishment is often beyond the appreciation of the young child, and some children who resent a punishment as unjust may be quite satisfied when the same punishment is inflicted without any appeal to high ideals, merely because the one who punishes is stronger and places it upon the low level of revenge. But hygiene raises grave doubts in regard to such punishment after the early years. Corporal punishment should seldom, if ever, be resorted to in the school; and, while there may be a question about the advisability of corporal punishment in case of younger children, at the age of puberty and thereafter there seems no justification for it. A blow is recognized as an insult in case of an adult. The corporal punishment of soldiers is forbidden. No one can maintain, argues Traugott, that discipline in the German army has been decreased since whipping and the like were abolished; on the other hand, the German army since then stands morally higher and is more efficient and trustworthy. If an uncultured underofficer in anger cuffs a soldier on the ears, he is punished for his misconduct. If a cultivated teacher, whether angry or not, cuffs a child on the ears, this is not called mistreatment of children, but a justifiable means of education. "Where is the difference?" W. H. B.

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PUNISHMENTS AND REWARDS. — These terms may be used with a wide or a narrow meaning. In the wider sense punishments and rewards are the bad and the good consequences of our acts. Thus for putting his finger in the fire the child is punished with the pain of a burning. He is rewarded for his study with power to read, etc. In the narrower sense punishment is suffering or deprivation intentionally inflicted upon an offender for an infraction of a law. Reward is the unusual possession, privilege, or enjoyment bestowed upon one who has displayed especial excellence in some field approved by the donor. The broader and narrower meanings of these two terms tend to be confused in ordinary thought. Natural consequences are put side by side with artificial penalties and rewards. This is especially true with primitive men and with the child, by both of whom natural events are often regarded as the outcome of wills, or, on the other hand, the rules of society or the commands of individuals treated as though they were the inevitable laws of nature.

If we take punishment and reward in the narrower sense, we note at once that society has relied primarily on punishments to bring about law and order. Similarly the school has usually fallen back on penalties as a means of preserving discipline. The sanction of the law is in jurisprudence the punishment of its violation. Both the state and the school have been interested in the realization and the preservation of a standard type of conduct to which all were expected to conform. The predominance of this conception and method in the school has been seen in the extent to which failure to learn has been penalized. Slowly, however, the idea has made its way that one should not be punished for mental shortcomings, but only for moral offenses. The result has been that penalties have more and more come to be restricted to such conduct as interferes with the work of the school. The more positive appeal of the reward has come to be the main reliance in getting the progress in knowledge and skill which it has been the business of the school to promote.

The school has come not only to employ rewards, or positive incentives, rather than punishment, but it has also reformed the character of both agencies, so as to get better educational results than at first. This may be best shown by studying the varieties of punishment and reward and noting their history.

Types of Punishment. — We may roughly divide punishments into four classes: (1) corporal punishment, (2) confinement and detention, (3) disgrace, (4) deprivation of privileges or rewards.

Corporal Punishment. — Historically, corporal punishment has been so important that a special account of it will be found in the preceding article under PUNISHMENT, CORPORAL.

Confinement and Detention. — These punishments are in general analogous to imprisonment. They vary from actual solitary confinement in a school prison to keeping a pupil in restraint in the schoolroom while others are having a recess, or after they have gone home. The school prison has been employed especially by military schools or those having in part a military régime, and the prison is like the "guard house." When pupils are confined in the schoolroom, usually they are set at some school task. When they are punished for a failure to get certain lessons, the learning of these is the natural penalty. On the other hand, when pupils are detained for disorder, etc., it has usually been the custom to require them to do some additional study not prescribed to others. One of the commonest of such tasks is the memorizing of a certain number of lines of prose or poetry. This penalty comes down from the Middle Ages and was common in English schools, where the learning of lines in Latin or Greek was one of the principal punishments. The custom was also introduced by English masters into some American schools, the prose or verse being sometimes in English instead of in the classical languages.

Disgrace. — In a sense all punishment is disgrace, although where this result is not directly intended a pupil who bears a severe penalty with courageous indifference may be lionized by his comrades. The forms of disgrace range from common scolding to ceremonial public reproof. Notes of complaint to parents, a roll of dishonor displayed publicly, low grade in deportment, are methods much employed in American schools. Ridicule is one of the most potent, as well as most dangerous, forms of disgrace.

Deprivation of Privileges or Rewards. — Here we have a wide range of devices dependent largely upon the organization of the school work. Where pupil associations exist, or any measure of self-government obtains, the penalty of exclusion from or deprivation of certain offices or responsibilities that are held in honor is a most effective penalty. Where certain rewards for good conduct, as holidays, excursions, early release from school, etc., prevail, there the exclusion from them constitutes a penalty. With older children, the extremer punishments of suspension or expulsion from school are employed. It is to be noted that deprivation of privileges almost invariably involves disgrace.

Nature and Function of Punishment. — In discussing the tendencies of the school with reference to the use of these various penalties it may be helpful to consider the theories of the nature and function of punishment. Four principal conceptions exist: (1) retaliation, (2) example, (3) the protection of society, (4) the reformation of the offender. The theory of retaliation is an endeavor to justify punishment on the ground that what you have done to others can with fairness be done to you. By it the instinct of justice, of vengeance, is realized through the interference of society. The individual may be too weak to protect himself, to avenge his wrongs. Society equalizes matters, and those who on account of superior strength or cunning might outrage others with impunity are treated as they have dealt with their fellows. Retaliation constitutes a very simple and easily understood theory of punishment, and one that appeals immediately to the sense of justice of both primitive men and children. It finds, however, little place in the school practice, except where a child has intentionally hurt another, or deprived him of his possessions or privileges. In that event the best penalty is often a retaliatory one. The bully should be whipped, and this is, perhaps, the one case that justifies corporal punishment.

Punishment for the sake of example justifies itself merely on the ground of expediency. It is very common among teachers. It is an attempt to terrify the social group by the spectacle of what awaits the offender. It often gains a large measure of success. This success is, however, frequently purchased at the expense of the resentment, not only of the one punished, but also of the spectators. Since its aim is to terrify, it is apt to create an antagonism between teacher and pupils. This will be especially likely to happen in case the punishment is made unduly severe, as is the temptation where exemplary effects are sought. Only where the punishment is just in itself is its use as an example either justifiable or safe. In the school, exemplary punishment is apt to do more harm than good.

Punishment for the protection of society consists in restraint upon the offender to prevent a repetition of the offense. (See Penology, Educational Aspect of.)

The history of school punishment has shown progress away from mere exemplary or terrifying punishments toward those that are positively educative. The gradual disappearance of corporal punishment has been due especially to the rise of a humanitarian spirit, and to the discovery of the futility of such penalties, but beneath it all there has been a feeling that such treatment is educationally debasing. It teaches the young to regard physical pain as the worst of evils, when the moral judgment of society holds that other inflictions are really more to be dreaded. We do not want to teach children to fear pain, but rather to love righteousness. Similarly, confinement and detention, although they offer opportunity for reflection upon evil conduct and its consequences, are not calculated to reveal in a positive way the desirability of moral excellence. We have seen that detention is apt to be coupled with the requirement of a certain amount of work. Since such work is a penalty, its infliction naturally creates a hatred of it. If, as is common, it is similar to other school work, this dislike is apt to spread. Thus, punishment creates a hatred of that in which it is the business of the school to inspire interest.

That some form of disgrace, such as reproof, must always be a main factor in discipline, we cannot doubt. The penalty is, however, beset with dangers. In the first place, it may become so commonplace as to inspire indifference. On the other hand, when the disgrace is keenly felt, its effect is often to break the spirit. Such a result is educationally bad. The school aims not to humiliate, but to instill self-respect. Finally, of all penalties, disgrace is most apt to inspire resentment, and thus to prevent rather than to secure the reformation of the offender.

The deprivation of privileges or rewards is of all the types of punishment that of most positive value educationally. For it directs attention toward some desirable thing which the school wishes the child to be eager to attain. Hence, while it is plain that at present the penalty is limited to few occasions, we see in it a type of the most desirable discipline both in life and in the school, a discipline that teaches values rather than disadvantages, and inspires with hope of reward rather than with fear of disgrace or pain. It is evident that in the history of punishment the tendency has been toward those penalties the effect of which is to emphasize positively the ideal good things toward which education is pointing. This tendency carries with it, as we have seen, a drift toward the use of rewards rather than penalties.

Rewards. — Rewards, like punishments, differ greatly in their educational effects. We may classify them as follows: (1) prizes, (2) honors, (3) privileges, (4) honor societies, (5) special advancement. From the educational point of view, it would seem that the best reward would be the one that would most clearly direct attention toward the true aim which the conduct or the study concerned exists to promote. It follows that rewards should be as far as possible the intrinsic results of the school work. These should be in evidence as much as possible, and in order to emphasize them the school may employ to advantage the artificial accentuation of rewards.

Prizes. — These have been used from time immemorial, yet there is constant drift away from them. The reason would seem to be that gifts of this or that material thing are not natural consequences of school work, and fail to cultivate directly a taste for it. Of all prizes, books or other materials used in study seem most nearly to approximate intrinsic rewards for the pursuits of the school. Money prizes, while apt to be highly valued, are, unless they take the form of scholarships or opportunities for study, not especially appropriate as school rewards, and in consequence have not been much employed.

Honors. — Of all the kinds of reward, honors have been most frequently employed by the school. The varieties of honor include incidental commendation, special attention from the teacher, scholarship grades, rolls of honor, positions of precedence in the class, special parts in graduation exercises, and so on. All kinds of rewards carry with them honor. Many prizes, such as medals or the "crown of wild olive," have little or no value except for the distinction of getting them. It might seem, therefore, as though honors are the natural reward for school work. However, two objections may be made against relying entirely or even largely upon them as incentives to excellence: (1) honor as such is not a consequence of good conduct or mental attainment any more than of anything else that is excellent; (2) honors can be given only to a few or they cease to be honors.

Privileges. — The privilege can be extended more widely than the honor. Indeed, there is no reason why privileges accessible to all should not exist. Relief from surveillance as a reward of good conduct, relief from tasks as a reward for scholarship, admission to the use of special books, apparatus, or materials for study or to special forms of enjoyment associated with school life are but a few of the many forms that privilege may take. It is evident that the privilege can be so contrived as to seem a natural and specific consequence of the conduct or effort to which it is attached. The positive privilege, such as new opportunities along the lines of school work, is evidently more educational than the negative one of relief from tasks.

Honor Societies. — The honor society would seem a peculiarly appropriate form of privilege, for the chance to associate with a select group is a natural consequence of attaining the standard on the basis of which its members are chosen. Many honor societies, however, afford little companionship, and membership is, therefore, merely an honor. Moreover, there is always danger that honor societies will become clannish, or snobbish, or agencies to promote any of the interests of their members as against the outsiders.

Advancement and Promotion. — In general, that privilege which is fairest, capable of being distributed most widely, connected most inherently with the nature of the work, and most likely to create a special interest in it, is advancement in the line of activity that it represents. This is especially important when this activity is seen to be one of the great pursuits of life outside as well as inside the school, so that promotion in the school is plainly advancement for life. Where success in school work means recommendation to positions or to opportunities after one leaves school, there the highest incentive to excellence is attained. So important and far-reaching a reward needs to be bestowed with especial care, and many, indeed, are the opportunities for injustice in its distribution. On the other hand, there can be no doubt that here we have the reward upon which the school not only should but is coming to place its reliance. The organization of the life of the school so as to make the prize of promotion in some great human activity the fundamental incentive all along the line has not yet been made, but we are certainly tending toward it. E. N. H.

See Monitorial Education; Punishment, Corporal; Moral Education; School Management; Penology, Educational Aspects of.

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PUPIL GOVERNMENT. — See Self-Government.

PUPIL TEACHER. — See England, Education in; Examinations.

PUPIL TEACHER SYSTEM. — See England, Education in; Teachers, Training of.

PUPILS, ORDER AND CONTROL OF, IN SCHOOLROOM. — See School Management.

PUPILS' RIGHTS, DUTIES, AND OBLIGATIONS. — United States. — The school laws of every state contain somewhat minute information on these topics. The rights of pupils consist largely in the right to attend schools until they have completed the course of instruction (in many states specified as from six to twenty-one years of age), and to receive proper instruction and care. The enforcement of the compulsory education laws (see Attendance, Compulsory; and Childhood, Legislation for the Conservation and Protection of) and of the child labor laws (see Child Labor) is now usually regarded as protecting the educational rights of children. California calls its compulsory education law "An Act to enforce the Educational Rights of Children." Repeated Supreme Court decisions have confirmed the rights of the state to compel the attendance of children. The following decisions cover this right of the state: —

Comw. *vs.* Roberts, 159 Mass., 372.
Quigley *vs.* State, 3 Ohio Cir. Dec., 310; 5 Ohio Cir. Ct., 638.
Comw. *vs.* Hammer, 9 Pa. Dist. 251.
State *vs.* McCaffrey, 69 Vt., 85.
State *vs.* McDonald, 25 Wash., 122.
State *vs.* Bailey, 157 Ind., 324.
Lynn *vs.* Essex Co., 148 Mass., 148; 153 Mass., 40.
Reynolds *vs.* Bd. Educ., 33 N. Y. App. Div., 88.

In return for this right to attend the schools provided, the state very properly requires of pupils that they attend to their studies, be prompt and punctual in attendance, properly excuse all absences, give proper attention and deportment, obey all reasonable rules and regulations, and submit to proper punishment for disobedience. By laws, rules and regulations, and court decisions, the teacher has been made to stand *in loco parentis,* and has had delegated to him so much of the authority of the state and the power of the parent to restrain and correct as is necessary to meet the needs of the situation he is employed to manage. The teacher is not to inflict wanton, malicious, or excessive punishment, and must exercise judgment and discretion, but if this is done, he is not liable for arrest for assault and battery, or to suit for damages. The following Supreme Court decisions cover these points: —

State *vs.* Burton, 45 Wis., 150.
Fitzgerald *vs.* Northcote, 4 F. and F., 656.

State *vs.* Webber, 108 Ind., 31.
Rulison *vs.* Post, 79 Ill., 567.
Hutton *vs.* State, 23 Tex. App., 386.
Hathway *vs.* Rice, 19 Vt., 102.
Rhall *vs.* Bd. Educ., 40 N. Y., App. Div., 412.
Bourne *vs.* State, 35 Nebr., 1.
Russel *vs.* Lynnfield, 116 Mass., 365.
Burdick, *vs.* Babcock, 31 Iowa, 562.
Fertich *vs.* Michener, 111 Ind., 472.

If the pupil persists in violating the laws or the rules and regulations, he makes himself liable not only to punishment, but also to suspension or expulsion, with a forfeiture, in part or in whole, of his right to attend the school. Even conduct detrimental or subversive to good order or discipline, when there has been no real infraction of a rule, may also be ground for withdrawing the privileges of the school from a pupil. Suspension or expulsion may also be incurred, though the acts complained of were authorized, or even directed, by the parent. If the teacher and school authorities act in good faith, they are not liable for any damages, though mandamus may lie to compel a board of school directors or board of education to show cause why the pupil should not be reinstated. The following court decisions illustrate these points: —

Ferriter *vs.* Tyler, 48 Vt., 444.
Rulison *vs.* Post, 79 Ill., 567.
Murphy *vs.* Bd. Dirs., 30 Iowa, 429.
Hodgkins *vs.* Rockport, 105 Mass., 475.
State *vs.* Webber, 108 Ind., 31.
Spiller *vs.* Woburn, 12 Allen (Mass.), 127.
Bd. Educ. *vs.* Helston, 32 Ill. App., 301.
Burdick *vs.* Babcock, 31 Iowa, 562.
Fessman *vs.* Seeley (Texas Civil App., 1895), S. W. Rep., 268.

The rules and regulations of the school board may also cover offenses committed outside of the school or outside of school hours, if the effect of such acts reaches within the school and is detrimental to the order or to the best interests of the school. This covers all such offenses as insulting the teacher outside of the school, acts of immorality committed, taking part in interdicted school or inter-school sports, and membership in secret fraternities. The following decisions cover these points. The sixth and seventh cases cited are fraternity cases, and the eighth is a football case.

Landers *vs.* Seaver, 32 Vt., 114.
Sherman *vs.* Charlestown, 8 Cush. (Mass.), 160.
Deskins *vs.* Gose, 85 Mo., 185.
State *vs.* Dist. Sch. Bd., Dist. No. 1, Supr. Ct. Wis., 1908; 116 N. W. Rep. 232. (Bul. 7, 1908, U. S. Bu. Educ.)
Hobbs *vs.* Germany, Miss. Supr. Ct., 1909; 49 So., 515. (Bul. 2, 1910, U. S. Bu. Educ.)
Weyland *vs.* Bd. Sch. Dirs. Seattle, Wash., Supr. Ct., 1906; 86 Pac., 642. (Bul. 3, 1906, U. S. Bu. Educ.)
Wilson *vs.* Bd. Educ. Chicago, Ill. Supr. Ct., 1908; 84 N. E., 697. (Bul. 7, 1908, U. S. Bu. Educ.)
Kinzer *vs.* Dirs. Indep. Sch. Dist. of Marion, Iowa Supr. Ct., 1906. 105 N. W., 686. (Bul. 3, 1906, U. S. Bu. Educ.)

Boards of school trustees or boards of education may also make and enforce any reasonable rules and regulations relating to courses of study, study hours, graduation, etc., and pupils who fail to comply with such may be denied the privileges of the school, though some courts have held that pupils must be excused from a requirement to study a particular subject, if the parent requests it, provided such action does not prejudice the equal rights of other pupils. The following decisions are along this line: —

State *vs.* Webber, 108 Ind., 31.
State *vs.* Mizner, 50 Iowa, 145.
Guernsey *vs.* Pitkin, 32 Vt., 224.
Morrow *vs.* Wood, 35 Wis., 59.
Bd. of Educ. of Sycamore *vs.* State, Ohio Supr. Ct., 1909; 88 N. E. Rep., 412. (Bul. 2, 1910, U. S. Bu. Educ.)
Sch. Bd. Dist. 18, Garvin Co. *vs.* Thompson, Okla. Supr. Ct., 1909; 103 P., 578. (Bul. 2, 1910. U. S. Bu. Educ.)

The tendency of all of these decisions, supporting laws enacted by the states, and rules and regulations enacted by boards of education and boards of school directors, is to declare that "any rule of the school, not subversive of the rights of the child or the parents, or in conflict with humanity or the precepts of divine law, which tends to advance the object of the law in establishing public schools, must be considered reasonable and proper" (Burdick *vs.* Babcock, 31 Iowa, 562. E. P. C.

Germany. — Children of school age have by law a right to be admitted to school in Prussia (Ministerial Decree, Jan. 21, 1882). Pupils absenting themselves must have a reasonable excuse for staying away from school. Where no justifiable cause is given, parents may be punished by police law and children may be compelled to attend by the aid of police. The teacher in the elementary school stands *in loco parentis* to his pupils and has the same rights of punishment. The right must not be exercised in such a way as to injure health. For excessive punishment the teacher is liable to disciplinary measures by the school authorities, or, where injury is done, is open to legal process for assault, in which case the penalty may be fine or imprisonment. Where a teacher punishes an innocent pupil or a pupil who disobeys an order which it is not within the province of the teacher to give, he is liable. The teacher has the right to punish pupils outside the school and school hours, and the pupil need not be a member of his class but must belong to his school. All punishments must be recorded. Pupils may be detained after school, but must not be kept beyond meal times, and must be under the supervision of a teacher. When possible, parents should be informed both of corporal and other punishments. Courses of study, hours of attendance, vacations, etc., are decided by higher authorities.

In secondary schools pupils in the three lowest classes are subject to corporal punishment, and other customary penalties may be imposed including arrest and detention, and in the last resort, expulsion. Pupils may be expelled if they are backward in their school work, but only if they fail to secure promotion for two successive years. In other points the relations between pupils and teachers are the same as in the elementary school.

England. — It is the duty of the parent, guardian, or person liable to maintain or actually in custody of a child between the ages of five and fourteen years to cause such child to receive efficient elementary instruction in reading, writing, and arithmetic; and if such responsible person fails to perform such duty, he is liable to be brought by the local education authority before a court of summary jurisdiction and fined 20*s*., and provision may be made by orders for the attendance of the child at some certified efficient school (see Elementary Education Act, 1876, S.S. 4, 11, 12, 37 and Elementary Education Act, 1900, S.Y. (2)). For cases in which whole or part exemption is permitted see Part-time Attendance of Pupils. There is no compulsion to attend any form of secondary teaching, but the court will compel a boy to return to school if he refuses to obey the order of his guardian (Hall *v*. Hall, (1749), and 721, an Eton case).

A schoolmaster has the power to punish in delegation from the parent, and the power extends to the conduct of pupils on the way to or from school (Clerg *v*. Booth, (1893) 1 Q.B. 465). The punishment must be reasonable (Gardner *v*. Bysgrave, (1889) 6 T.L.R. 23); it may be delegated in secondary schools by the head master to a prefect or monitor (*Re* Basingstoke School, (1877) 41 J.P. 118). An assistant master in charge of a class has the right to punish (Mansell *v*. Griffin, (1908) 1 K.B. 160, 947). The extent of legal chastisement depends in part on the child's physical condition (Stocking *v*. Collen Tunn, (London) Sept. 29, 1906). Blows on the head are unlawful (R. *v*. Hoply, (1860) 2 F. & F. 206). The Prevention of Cruelty to Children Act, 1904 (S. 28), specially retains the right of "any parent, teacher, or other person having the lawful control or charge of a child to administer punishment to such child." Despite a contract not to remove a child from the custody of a school during term, the parent can remove such child (R. *v*. Barnardo, (1890) 2 Q.B.D. 283; (1892) A.C. 326). The parent's remedy is by writ of *Habeas Corpus* (see also Price *v*. Wilkins, (1888) 58 C. T. 680, 682). A schoolmaster has the right of expulsion for reasonable causes (Fitzgerald *v*. Northcote, (1865) 4 F. & F. 656; Hutt *v*. Haileybury College, (1888) 4 T.L.R. 623). It is illegal to detain a child for not doing home lessons, as such lessons are not authorized by the Elementary Education acts. But detention beyond school hours as a pure matter of discipline is not actionable (see Mansell *v*. Griffin, (1908) 1 K.B. 167). The managers of a school are not personally responsible to a pupil for injury caused by an assistant teacher solely dismissible by the head teacher. The whole question of discipline and organization was dealt with by *Revised Instructions* issued by the Board of Education on 13 May, 1902. Governors or visitors of an endowed school may delegate curriculum, time-tables, choice of books, to the masters (A.G. *v*. Clarendon, (1810) 17 Ves. 507), but in fact curricula, examinations, and time-tables are largely affected by regulations of the board of education and schemes under various acts. A master must safeguard in a reasonable fashion the goods and effects of a pupil (see Scarborough *v*. Cosgrave, (1905) 2 K.B. 805 — boarding-house keeper case). It appears to be the duty of a master to take reasonable steps to protect the public from the mischievous acts of children (King *v*. Ford, (1816) 1 Stark. 421), though apparently no action lies against the schoolmaster on the ground of nuisance (Harrison *v*. Good, (1872) 11 Eg. 352, and see R. *v*. Pearce, (1898) 67 C.T.A.B. 842). No pupil can, on the ground of religious belief, be excluded from or placed in an inferior position in any school, college, or hostel provided by a local education authority (Education Act, 1902, S. 4). An evening school is not an elementary school, and there is no compulsion to attend such school (Education Act, 1902, S. 22 (11)).

J. E. G. de M.

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PURDUE UNIVERSITY. — The land grant college of Indiana, established under the Morrill Act (*q.v.*). Organization was effected on May 2, 1869, and because of donations of land and money by John Purdue and other citizens of Lafayette, Indiana, the institution was located at that place and named by act of legislature, Purdue University. The first classes were organized early in 1874.

The institution offers courses of study of college grade in the natural sciences, technology, and agriculture, conferring upon its graduates the degree of Bachelor of Science. It is coeducational. The different schools of study are as follows: agriculture; civil engineering; electrical engineering; mechanical engineering; chemical engineering; science; pharmacy. In addition to the above, departments of instruction are maintained in English, mathematics, history, modern languages, economics, education, military science. Other coördinate branches of the University are the Agricultural Experiment Station and the department of Agricultural Extension.

The organization of the University consists of the board of trustees, nine in number, appointed by the governor for terms of six years each; the faculty of instruction, numbering 160 persons; the staff of the agricultural experiment station, numbering forty persons; and the staff of the department of agricultural extension, numbering five persons.

The institution is maintained by the proceeds of the land grant originally donated to the state of Indiana by Congress; by various supplementary acts of Congress appropriating funds from the federal treasury; by the proceeds of a tax of one-tenth mill on each dollar of property in the state of Indiana; by statutory appropriations to the experiment station and department of agricultural extension; by student fees; and from time to time by specific appropriations of the state legislature for special purposes.

There are 277 acres of land, twenty-one principal and twelve minor buildings. The title to the property of the University is vested in the state and is valued as follows: lands, $120,000; buildings, $1,064,500; equipment, $546,347; total value, $1,654,462.

Student attendance reaches 2000 annually, and 363 degrees were conferred in 1911. Over 3900 students have been graduated, and about 8000 have attended the institution for a longer or shorter period. W. E. S.

PURITANS IN EDUCATION. — See Calvinism in Education; Commonwealth in England and Education; Dissenters in Education.

PURITY. — See Sex Hygiene.

PUZZLES, PSYCHOLOGICAL. — Puzzle material has been employed for the study of habit formation, transfer of training, thought processes, and interests, and it has also been used to some extent for mental tests. It has been applied to the study of the mental life of animals, children, primitive peoples, and of the feeble-minded as well as of normal adults. Lindley has classified puzzles into five groups: language and word; mechanical; mathematical; logical and philosophical; dilemmas of etiquette, ethics, etc. The characteristic puzzle features are, however, not limited to the conventional puzzles. Among the Binet tests the sentence building, absurd statement, problem question, and geometrical design tests are of the puzzle type. This is also true of the questions employed by Buehler, Woodworth, and others in the study of the thought processes. Practically every form of mental test has something of the puzzle quality when taken by the subject for the first time.

Puzzles of the mechanical and mathematical types involving actual physical manipulation offer some distinctive advantages as a means of studying mental processes. Many of them can be employed independently of verbal means of expression and so can be used in the study of the mental life of animals, of human beings with undeveloped or defective linguistic ability, due to whatever causes, and of those of a different language from that of the experimenter. These puzzles make possible a study of behavior and reveal processes which would not be evident even were there no linguistic barriers. The labyrinth and the puzzle-box methods of studying animals were brought into prominence by Thorndike, *Animal Intelligence*, 1898, and have been widely used. The maze or labyrinth requires only locomotion on the part of the animal, while the puzzle-box necessitates the manipulation of some mechanical device such as a lever, bolt, pulleys or combination of these. The animal is punished for failure, or rewarded for success, or both. The time of learning for successive trials and the number of errors are plotted as curves of learning, or habit formation. The labyrinth method has been employed with the crab, crayfish, frog, turtle, fundulus, guinea pig, white rat, dancing mouse, chick, sparrow, pigeon, and monkey. The puzzle-box method has been used especially with cats, dogs, rats, raccoons, sparrows, and monkeys. The success of the animal is naturally a function of his motor and sensory equipment, and of his habits and instincts as well as of a hypothetical "general intelligence." The rat excels in learning the maze, the raccoon and monkey in dealing with locks. The two latter animals have learned to open boxes fastened by four devices which it was necessary to manipulate in a fixed order. The raccoon has retained memory of single simple devices for a period of one year. The higher animals show some transfer, usually positive, when given a new device only partly similar to the first..

Kinnaman made a comparative study of adults, children, and monkeys in learning the combination lock. There were two individuals in each of the three groups. The times required for trials one and two are given herewith: —

	Adults		Children		Monkeys	
	Seconds		Seconds		Seconds	
Trial 1	11	36	105	20	139	187
Trial 2	2	4	6	3	110	26

The behavior of the children seemed to Kinnaman to resemble more closely that of the monkeys than that of the adults. Woodworth used the same apparatus in studying the primitive peoples at the St. Louis World's Fair. Lindley found that young children, grade III, profited very slowly in dealing with a complex unicursal or maze puzzle. He found the age of greatest puzzle interest to be twelve years. He thinks that ability to solve puzzles is correlated positively with originality, inventiveness, and practical capacity. Terman employed a number of puzzles in a study of "bright" and "stupid" children. He found the rank of the children to be approximately the same in the different tests and to agree closely with the school rating.

The presence in the Binet Tests of material of the puzzle type has been mentioned. The "form board," used especially by Norsworthy and Goddard, has met with favor in tests of feeble-mindedness. Blocks cut into geometrical forms are to be placed as rapidly as possible into similarly shaped indentations in a board.

Practice curves may be taken very quickly and easily with mechanical puzzles as compared with more complex activities such as learning shorthand, telegraphy, or a foreign language. There are fewer elements and fewer associations to be formed. Method plays a large part in the acquisition of skill. The methods may be hit upon by chance or by anticipation, but they seem to be most effective when used reflectively and critically tested as hypothesis. Minor details of manipulation become problems similar in character to the original one of solving the puzzles as a whole. Puzzle material is usually rather unrelated to the subject's experience, so that he has no specific habits ready to cope with the problem. For this reason his attitudes — emotional, attentive, volitional — and his methods of thinking come to have special significance and prominence. The puzzle often gives the suggestion of impossibility, and determination is necessary to keep oneself at the task. Irrelevant details may be quite prominent as compared with the significant ones, but this is true also of problems of everyday life. The number of possible ways of beginning is usually very great. One must beware of falling into a rut; he needs to keep his assumptions flexible, to classify the possibilities, and critically evaluate them. These conditions of efficiency in solving puzzle problems seem to be similar to those involved in meeting novel situations in general. If these conditions are analyzed out and set up as ideals of method, positive transfer of a very valuable sort may result. Similarly positive transfer from mathematics, *e.g.* to puzzle-solving, seems to be in these methods of thought control rather than in specific habits or information. There seems to be in school work a special lack of training along the line of dynamics, of the capacity at least of working out the pathway of a point moving in three dimensions. Mechanical puzzles furnish good opportunities for the study of transfer within a single system, that is, from one puzzle to another. In the Chinese ring puzzle, for example, if the general principle has been developed during the solution of the puzzle in one form, the specific habits developed in that form can be directly and positively carried over to another form. If no general principle has been developed, the subject is likely to experience great difficulty. Puzzles offer a wide range of material for the study of the transfer of general and specific elements. At one extreme there may be little in common except these generalized methods of thought control; at the other, the specific habits may be almost identical.

Two marked advantages possessed by puzzle material as tests of intelligence are: (1) independence of verbal expression, and (2) the possibility of training subjects to practical equality in the manipulation of some form, testing their capacity to handle variants from that of different degrees of remoteness and thus getting at intelligence rather than training. Short practice series are better as tests than single trials. Puzzles should be so chosen that it is possible logically to limit the number of possibilities of solution and to develop a rule of procedure to apply to new cases.

H. A. R.

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PYTHAGORAS (*c.* 580–500 B.C.). — The earliest educational theorist of Greece and the most learned man of his time, was a native of Samos and a pupil of Anaximander and Pherecydes. After gathering stores of knowledge from many lands, he established a school at Croton in Southern Italy. Here he organized a brotherhood of disciples, who lived under strict ascetic rule and aimed at a perfect life. The society was secret and had a high ethical and reformatory character. Pythagoras was the first man in the western world to establish an ethical institution apart from the state. He insisted upon mental and physical soundness, morality, and self-control. He held that all good consists in order and proportion, and that the aim of education is to find for each person his rightful place and make him efficient therein. The Pythagoreans were masters of all the sciences known, especially mathematics, and combined with the study of these the pursuit of many arts and crafts. The fraternity gained a great reputation for virtue and knowledge, but became entangled in politics, and its members were driven as fugitives into all parts of Italy and Greece. It continued to exist for some three centuries and exerted a deep and abiding influence. The ethical principles of Pythagoras and the practical morality of the society are embodied in the *Golden Words*, which are the only literary legacy they have left us.

W. R.

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QUACKENBOS, GEORGE PAYN (1826–1881). — Author of many textbooks; graduated from Columbia University in 1843. He was for many years principal of public schools in New York City. His publications include Spier's *French Dictionary* (1850), *First Lessons in Composition* (1851), *Course in Rhetoric and Composition* (1854), *School History of the United States* (1857), *Natural Philosophy* (1859), a series of school grammars (1862–1864), a series of arithmetics (1863–1870), *Language Lessons* (1876), *American History* (1877), and Appleton's *Geography* (1880).
W. S. M.

QUADRIVIUM. — See Liberal Arts, Seven; Middle Ages, Education in.

QUAKERS. — See Friends, Educational Influence of.

QUALIFICATIONS OF TEACHERS. — See Teachers, Qualification of.

QUALITY. — The characteristic of a sensation that makes it different from every other. The doctrine of specific energies assumes that the quality of a sensation is related to the peculiar sort of nerve ending that receives it. The theory derives plausibility from the fact that the same nerve-end always responds in approximately the same way, no matter what the stimulus may be. It is probably true only within limits, but serves as a convenient principle for the classification of sense qualities. The number of simple qualities is uncertain, but in the narrowest sense there are probably not more than fifty. An enumeration of qualities will be found under the different senses.
W. B. P.

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QUEBEC, EDUCATION IN. — See Canada, Education in.

QUEEN ELIZABETH'S ACADEMY. — See Gilbert, Sir Humphrey.

QUEEN'S COLLEGE, BELFAST. — See Belfast University; Ireland, Education in.

QUEEN'S COLLEGE OR QUEEN'S UNIVERSITY, KINGSTON, CANADA. — Founded in 1841 as a nonsectarian college as a protest against the denominational control of the Provincial University. However, denominational tests were exacted by the faculty, a theological faculty was constituted, and a grant from the Provincial Government was received. The withdrawal of the grant in 1868 together with the loss of the accumulated endowment through bank failure in the same year led to a ten-years' period of great depression. Under Principal Rev. G. M. Grant (1877–1902) a vigorous institution was built up. To the two original faculties of Arts and Theology, Medicine was added in 1854, Mines in 1893, and Education in 1907.

The student enrollment in 1911–12 was 1507. The present principal is Rev. Daniel M. Gordon, LL.D., and the Chancellor (since 1880) is Sir Sandford Fleming, LL.D.

QUEENSLAND, EDUCATION IN. — See Australia, Education in.

QUESTIONING. — **Uses of Questions.** — There are three somewhat distinct uses of questions observable in the present practice of teaching, which are as follows: (*a*) *As Tests of Knowledge.* Their most common use is as a test of knowledge, of the memory and the understanding of facts. Illustrations are found in any list of examination questions. (*b*) *As a Means for developing Subject Matter.* Questioning is also extensively relied upon by some teachers as a means of presenting new subject matter. In any subject where there is a close sequence of thought, it is often possible to use certain fundamental facts as a means for deducing others, until an entire topic is taught. Many parts of most studies in the elementary school are taught in this way, even including literature. This plan has been most extensively followed in Germany by Ziller and other disciples of Herbart; and Germany has exerted a very marked influence toward popularizing this method of instruction in the United States during the last twenty years. This use of questions is intimately related to that of Socrates, although it is much more constructive than his method often was. Its popularity among the Germans is indicated in the fact tnat such instruction has been known among them as "darstellender Unterricht," or instruction that leads to an especially graphic realization of the ideas presented. The questions proposed are supposed to be in such close sequence, and so intimately related to the experience of the pupils, that the latter enter into the spirit of the subject until they "see" the situation as though it were real. Of course such vividness is due in part to the fact that the pupils themselves are allowed to contribute some of the thought. (*c*) *As a Means for developing the Independence of Pupils.* A third use of questions aims primarily neither at testing knowledge, nor at developing a topic — although it may do each of these to some extent — but rather at the pupil's growth in self-reliance. In this case, the object is to ask only such questions as are necessary in order to start the pupil off alone, or to keep him going, in the mastery of a topic. All three of these uses of questions may be found in a single recitation, although, strange to say, the third use is very uncommon.

Skill in Questioning. — (*a*) *When using Questions as Tests of Knowledge.* — One difficulty in putting questions is to secure a wording that is clear and definite enough to get what is wanted. In desiring to teach the fact that soil is largely composed of rock-bits, a teacher asked, "What do you find in the soil?" thus allowing any number of answers without necessarily including the one in his mind. Even in so simple a matter as this, the right question is not easily found. A second difficulty is to make the questions sufficiently broad. Many examination questions lack scope, and owing to their narrowness, they direct attention away from the more fundamental portions, the principles, of a study, to its minor aspects. It is very common for teachers to ask from 100 to 200 questions in a single recitation period of thirty or forty minutes, and also to get the answers to all or most of them within that period of time. That number alone indicates how narrow and detailed questions commonly are; for comparatively few questions of much scope can be satisfactorily answered within forty minutes. The secret of the scrappy responses of children in class is found, to a large extent, in the scrappy character of the teacher's questions.

(*b*) *When using Questions for the Development of Subject Matter.* — When questions are largely depended upon for the unfolding of a new topic, a much higher degree of skill is demanded. For in an examination by questions, each question is usually considered alone, the teacher merely keeping in mind what constitutes a good question. But a *good series* of questions is necessary in development instruction, involving their grouping according to superiority and subordination, and their sequence. In other words, organization of questions is an important matter here, as important as organization of thought is in composition in general. It is not merely logical or scientific organization, either, that is needed. Such insight into the subject matter as would insure that kind of organization is to be presupposed, for one cannot hope to word good questions on a topic without thorough comprehension of the topic itself. But the organization to which such knowledge should lead is that based on the learner's own interest and method of approach — called the psychological organization in distinction from that which is merely logical or scientific. That kind presupposes an equally thorough comprehension of the learner's abilities and tendencies, in addition to other knowledge. It calls for questions dealing with facts, and also for others dealing with feelings, particularly feelings of value; and teachers accustomed to fact questions alone often find it extremely difficult to word the kind that tests appreciation. Perhaps enough has already been said to suggest that real skill in questioning, particularly in questioning so as to unfold a new subject, is made possible only through a thorough knowledge of subject matter and of method.

(*c*) *When using Questions for the Development of the Student's Independence.* — Questions aiming at growth of pupils' independence require knowledge of the subject and of the pupils' past experience, as just stated, with a peculiar appreciation of the present ability of the learner. For in this case, the questions, aiming to transfer the leadership from the teacher to the student, are concerned primarily with the latter's power to work. A series of questions having this object would be radically different from, and even more difficult than, a series aiming only to unfold a subject.

Merits of Questioning, as a Method of Instruction. — A method of instruction that makes much use of good questions possesses two important merits. In the first place, it compels special pointedness of thought. One can listen to a lecture or study a text, and reproduce the whole without focusing the attention on the exact points that are made. Indeed, that is easy for one who has a good verbal memory. But a pointed question forces one to think by "points." In the second place, good questions make the learner an active participant in the thinking that goes on, thereby fulfilling one of the most prominent conditions of good teaching.

Ages and Subjects for which Questioning is Suitable. — The use of questions for testing knowledge is generally considered fitting for all ages and subjects. Their use otherwise, however, is in much dispute. For instance, while the elementary school is generally expected to resort to questions extensively, the custom in colleges and universities is very different. Yet there seems to be no fundamental reason for this difference; for, outside of professional schools, the growth of the student is the aim alike in school and in college, and the psychological arguments are practically exactly the same in the two cases. One valid reason for some lecturing in these higher institutions is the large size of some of the classes. But aside from that consideration, the large amount of lecturing there seems to be due to conservatism only. It is an inheritance from a time when textbooks were wanting and when method of teaching had received little study.

F. M. M.

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Strayer, G. D. *Brief Course in the Teaching Process.* (New York, 1911.)
Thorndike, E. L. *Education.* (New York, 1912.)
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QUESTIONNAIRE. — A list of questions used for the purpose of securing information. The "questionnaire" method has usually been employed in statistical inquiries, *e.g.* the census, immigration returns, labor reports, etc. The method was borrowed by the psychologists, to secure information on the different phases of child life. Questionnaires were sent to people thought to be interested, to psychology classes, and to schools to be answered by the pupils. The results were then analyzed by the investigator, and the conclusions determined. Typical reports on such investigations may be found in the early numbers of the *Pedagogical Seminary* and the *American Journal of Psychology.* The use of the questionnaire method has been subjected to criticism in all studies which deal with opinions rather than facts. Where any attempt is made to go beyond a plain numerical answer or an answer of yes or no, there is the danger that the replies merely record the opinions of the few people who choose to reply, and these may be of no greater value than the opinion of the investigator. The further one moves from the questions of fact towards questions of subjective conditions, the greater is the likelihood of error. Further, it is very rare to obtain answers to all the questionnaires submitted, so that the replies of only a small number of people, already narrowly selected, can be dealt with. Nor do the answers in all cases completely cover the question. The final conclusions are necessarily a compound of partial responses and the subjective bias of the investigator.

There is still some place, however, for the questionnaire method, provided the questions are few in number, can be answered numerically or by "yes" or "no," cannot lead to any misunderstanding and can be answered without bias, and leave no loophole for a partial answer. Direct expert observations of representative cases with reference to all the factors involved, combined with a moderate amount of statistical care, will lead to more fruitful results in psychology and education than the questionnaire method.

See Mental Measurement; Statistical Method; Tests, Psychophysical.

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QUICK, ROBERT HERBERT (1831–1891). — English educational writer and schoolmaster; born in London the 20th of Sept. 1831. He was sent to the school at Harrow, but on account of delicate health was prepared for college by private tutors. He graduated in the mathematical tripos at Trinity College, Cambridge, in 1854. He was ordained in 1855 and for three years worked as an unpaid curate. The memory of his own school days, and the antiquated methods employed by his teachers, directed his attention to education as a career.

Mr. Quick gave up his parish work in 1858 and accepted a mastership in the Lancaster Grammar School. He passed in rapid succession to similar posts at Guilford, Hurstpierpont, and Cranley. In 1870 he became assistant master at Harrow, and from 1874 to 1881 he was head master of secondary schools at London and Guilford. In 1881 he was appointed by the University of Cambridge to give the first course of lectures on the history of education at that institution. He was also active in the Teachers' Guild of Great Britain and Ireland (*q.v.*), and other agencies having for their object the professional improvement of teachers.

Mr. Quick owes his large place in education not so much to his work as a schoolmaster, although in this he was distinctly progressive and much in advance of his time, but chiefly to his educational writings, and primarily to his book *Educational Reformers.* This has unquestionably been the most influential book on the history of education ever published in the English language; for Mr. Quick, very properly writes Frederic Storr, "was the first among English writers to succeed in making a book on education readable, and at the same time sober and rational." He got the inspiration for his *Educational Reformers* from the *American Journal of Education* by Henry Barnard (to whom he dedicated the revised edition of his book) and Schmid's *Encyklopädie der gesamten Erziehungs- und Unterrichtswesen.* It has become an epoch-making book, because Quick caught the spirit of the reformers whom he interpreted; and, in his running commentaries on the personalities and writings of the reformers, he provided some of the most important foundations for the scientific study of education. And in this sense Quick himself was one of the greatest educational reformers of modern times.

The success of the *Educational Reformers* was due almost entirely to its popularity in America, although it has since become a popular educational book in England. Mr. Quick always maintained that the Americans kept his book alive.

Mr. Quick's other educational writings include *Schoolmasters, Past and Present* (1879), *Improvement of Teachers* (1885), and numerous articles in educational journals. He also edited with notes and introductions Locke's *Thoughts Concerning Education* (1884) and Mulcaster's *Positions* (1888). Mr. Quick collected during his lifetime a large and valuable library on the history of education, and this has been presented to the Teachers' Guild of Great Britain and Ireland. W. S. M.

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See also the memorial articles by J. Llewellyn Davies, H. M. Butler, J. R. Seeley, *et al.*, in the *Journal of Education* (London) for April, 1891.

QUINCY, JOSIAH (1772–1864). — Fifteenth president of Harvard University; was prepared for college at Phillips Academy, Andover, and graduated from Harvard in 1790. He engaged in the practice of law and took an active part in public life. He was a member of the legislature of Massachusetts and the Congress of the United States, and was a leader in the antislavery movement. He was also mayor of the city of Boston from 1823 to 1828. He was chosen president of Harvard University in 1829 and held the post until 1845. He was an advocate of elective studies (*q.v.*), and, remarks one of his biographers, "the elective experiment was tried more thoroughly and on a broader scale during his administration than under any other down to the time of President Eliot." His educational writings include *History of Harvard University* (Boston, 1840). W. S. M.

See Harvard University.

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QUINCY MOVEMENT. — An able, progressive, and open-minded school committee and a wide-awake and enthusiastic school superintendent originated the "Quincy Movement." Charles Francis Adams, a distinguished citizen of Quincy, Mass., was elected a member of the local school committee in the early seventies. He had made a somewhat careful study of the secondary school course and had reached the conclusion that the philological and archæological study of the dead languages in high schools and colleges did not warrant the claims made for them as agencies in mental discipline (see his *College Fetich*). He was equally convinced that the elementary schools, with so much emphasis upon drill in the three R's, as educational means, were equally deficient. His colleagues on the school committee shared his viewpoint, and in 1875 Francis Wayland Parker (*q.v.*) was selected superintendent of the schools of Quincy and "given a free hand." The schools were made less artificial and conventional. The children were taken out of doors for lessons in science and geography. The character of the work in reading was shifted from drill to content upon the theory that the purpose of elementary education was not merely drill but nutrition. Special appeal was made to interest and emotional pleasure as dominating factors in all school studies; and the subjects in the course of study that could not be made interesting were not given so much prominence. The teachers were given a larger measure of freedom in the methods of instruction and the details of course of study. It was Colonel Parker's conviction that courses of study and detailed regulations were largely made for the benefit of poor teachers, and he argued that good teachers should be given some chance for initiative. Geography and nature study were given commanding places in the scheme of instruction and the sand table in the schoolroom and the sand piles in the schoolyards were extensively used in the development of concepts of structure. Local geography and local history (without the use of textbooks) became very live subjects. School studies were correlated. Spelling was taught in connection with the other branches; and language lessons, based upon observation of objects and concrete realities, took the place of the formal study of grammar. Great enthusiasm was developed among pupils and teachers and Quincy became the educational Mecca of New England. The summer schools for teachers that sprang into existence at this period grew out of conscious needs that the Quincy movement had created. The movement, however, met with opposition. Conservative New England schoolmen looked with suspicion upon the so-called "new education." It was claimed that Parker had turned the schools of Quincy into natural history museums and mud-pie factories. The children were amused and happy, it was granted, but did they learn the three R's? To settle this question the State Board of Education of Massachusetts decided to conduct an examination of the schools of Norfolk county. The examination was in reading, writing, spelling, written and mental arithmetic, geography, and history. The schools of Quincy came out far ahead of all the other schools of the county except in the one study of mental arithmetic. (See Walton, G. A., *Report of the Schools of Norfolk County, Mass.*, Boston, 1880. The towns are not given by name but by letter. C refers to Quincy.) The Quincy movement clearly demonstrated the value of expert supervision and it gave an impulse to a higher order of professional training of teachers. W. S. M.

See Parker, Francis Wayland.

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Philbrick, John D. Quincy Schools. *Education*, Vol. 1, pp. 299–308.

QUINET, EDGAR (1803–1875). — French teacher, writer, and statesman. So great was the success attained by him in his professorship of foreign literature at the University of Lyon, to which he was appointed in 1838, that Villemain, then minister of public instruction, created for him the chair of "southern comparative literature" (*literatures méridionales comparées*) at the College of France (1840). His lectures here provided the matter for several of his books, *Les Révolutions d'Italie*, *Le Christianisme et la Révolution française*, among others. Before long his republican and anti-clerical sentiments were responsible for the termination of his courses and the abolition of his chair. After the political changes of 1848, he was reappointed to his former position, but he soon left this for the more stirring life of the political arena. This was the period of his *Enseignement du peuple* (1850), a protest against the return to power of the clerical party in accordance with the provisions of the odious Falloux Law of that same year. During an exile of nineteen years he published his more important works, *Le philosophie de l'histoire de France* and *La révolution*, to cite only two. The turn of politics again saw him back in his native land, and he was chosen member of the National Assembly (1871). *La république, conditions de la régénération de la France* (1872), and *L'esprit nouveau* (1874) were the last publications of this most fecund writer. Throughout his life he struggled with pen and voice for those great principles of compulsory, free, and lay education which Jules Ferry (*q.v.*) finally succeeded in putting on the statute books of France in the early eighties. No one fought more heroically for these reforms than Quinet, and it seemed the irony of fate that he did not live to see these principles triumphant. F. E. F.

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QUINTILIAN (MARCUS FABIUS QUINTILIANUS). — Roman rhetor born at Calagurris in Spain about 38 A.D. His father, a teacher of rhetoric, took him at an early age to Rome and had him educated there for the bar. After practicing for a time in his native town, he returned to Rome with Galba in 68, where he soon opened a school of rhetoric, *i.e.* grammar, literature, and oratory. Among his pupils he numbered Pliny the Younger. His school was probably endowed by Vespasian and under Domitian he was raised to consular rank. After twenty years of teaching, which seem to have been extremely profitable, he retired from active life and devoted his remaining years to arranging his materials and putting together the fruits of his long experience in the work by which he is known, *De Institutione oratoria* (*Institutes of Oratory*), published about 95. Quintilian died about the close of the first century A.D. The *Institutes of Oratory* is a work in twelve books giving the principles for the training of the "orator." The work was dedicated to Marcellus Victorius, to be used in the education of his son, Geta. Educationally the importance of the work by no means lies in the technical side of the work. But in the first two and in the last book Quintilian considers the aim of education and the preliminary training which he regarded as fundamental for the equipment of the orator. "I am of opinion," he says, "that to make an orator we must begin from the beginning and I consequently shall begin to shape the studies of an orator from his infancy. . . ." The term orator had a wide connotation with Quintilian. The orator was not merely the man who could speak, the eloquent man; he was the *vir bonus dicendi peritus* (the virtuous man skilled in speaking); he was the *vir civilis*, the citizen who employed all his skill and ability and virtue in the service of the state. Hence the training of an orator included far more than mere technique or elocution; *eloquentia* meant more than oratorical power; it included literary ability, good taste and judgment, and virtuous conduct (*optima sentiens, optima dicens*).

Quintilian believed that education must begin at a very early age. Hence care must be taken in the choice of a nurse. Actual instruction may be commenced before the seventh year. Education is necessary to prevent mental stagnation. The child can be taught the alphabet early, not merely by memory or by rote, but by actually associating the shape and sound of the letters. Care must be taken that the young pupils speak slowly and distinctly. Writing may be learned by tracing and imitating letters. When the seventh year is reached, the time for definite instruction has come. Quintilian discusses the relative merits of private tutorial instruction and the public school, and decides emphatically in favor of the latter, on social as much as any other grounds. At the grammar school the pupil will learn above all the principles of grammar or the science of speaking and writing carefully (*emendate loquendi scribendique scientia*). And first Greek grammar will be taught, Latin being taken up later. Greek is of importance in the curriculum; by it ability is secured to study the various sciences

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in the original sources. (Compare with this the argument for the classics in the Renaissance period.) After learning the elements of grammar, the pupils proceed to literature and read as widely as possible, especially such works as are marked not only by excellence of style, but by moral worth of content. Rules of style and good usage can only be acquired by broad reading and observing the usage of scholars. The grammar school is succeeded by the school of the rhetor, who gives the technical training in style and composition. While rules of style are taught by him, the independence, spirit, and imagination of the pupils must be given free play. But to these qualities must be added the acquisition of ideas from reading the works of orators, historians, philosophers, and poets, the one way of training the judgment and good taste. Here again there is an insistence on the moral worth of the content (*id quod est oratori necessarium . . . evolvendis penitus auctoribus qui de virtute praecipiunt*). To the literary subjects Quintilian adds geometry and music, the one as a mental training, the other as a part of liberal education.

Throughout Quintilian insists that the teacher respect the individuality of the child. He stands in the place of the parent and is responsible for the result of his instruction. Character, to use a modern term, must be the end of education and all instruction should be educative to that end. Corporal punishment should be eliminated entirely, and the teacher's personality and the pupil's sense of honor must take its place. The teacher must come into close contact with his pupils, and for this purpose among others Quintilian advocates relaxation and games, in which the teacher should take part. And the product of his scheme of education is to be " the true citizen trained for the administration of public and private business, who can rule cities by his counsel, make them stable by laws, improve them by judgment, no other in fact than the orator."

No other educational work exercised so much influence on Renaissance educational thought as did the *Institutio Oratoria*. It was only discovered by Poggio at St. Gallen in 1417, although Petrarch may have had an incomplete copy. Centered as the Renaissance was in the Roman ideal, the importance of the *Institutes* was recognized by all educational leaders. With Plutarch's περὶ παίδων ἀγωγῆς Quintilian's work was for long the only educational treatise of the ancient period which was given any consideration. Vittorino is reported to have "extolled Quintilian in remarkable terms, as the best authority on life and scholarship." And Erasmus apologizes for his educational treatise "seeing that Quintilian has said in effect the last word on the matter." In Italy, Germany (Rudolph Agricola, Erasmus, Melanchthon), France (Budé, the *Collège Guyenne*, Rollin), and in England (Sir Thomas Elyot) Quintilian's ideas were widespread. And, indeed, it needed but the addition of the Christian ideal to the pagan's ideal of citizenship to make it acceptable to all educators. How far Quintilian's influence has come down in an unbroken line through Vittorino and Arnold of Rugby to the English public schools, it is difficult to say, but in large measure his ideas may be seen in the modern ideal of the " Christian gentleman."

See RHETORIC.

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QUIZ. — A term said to be a colloquial abbreviation of *question.* It usually means an informal examination conducted by the oral method, although sometimes loosely applied by students to short written examinations.

In college and university work the "quiz" is frequently the repetition through discussions and questions of the ground covered in a previous lecture.

QUOTIENT. — See DIVISION.

RABANUS (HRABANUS) MAURUS (784 (?)–856). — Medieval scholar and teacher, born at Mainz and at an early age sent to Fulda (*q.v.*) as an oblate of the order of St. Benedict. His ability soon showed itself and he was sent to Tours, where he studied under and became a favorite pupil of Alcuin, who called him Maurus after the favorite pupil of St. Benedict. He returned to Fulda in 801 but was again sent to Tours for a year in charge of a pupil (802). In 818 he was appointed head of the schools at Fulda, the *schola interior* for oblates, and the *schola exterior* for lay pupils. Rabanus was a keen student and a devoted teacher, and in a short time attracted pupils from all parts of Europe for both schools. From 822 to 842 he was abbot of Fulda and in 847 became Archbishop of Mainz. From 842 to 847 he lived in retirement and wrote the *De Universo*, an encyclopedic work based on Isidore (*q.v.*).

Rabanus was an ardent student of the seven liberal arts and of the classical and Biblical literatures. He wrote Biblical commentaries, an abstract of Priscian (*Excerptio de arte grammatica Prisciani*), a *De computo*, and a treatise on alphabets and abbreviations (*De inventione linguarum*), and a chronological work. For educational history, his most important work is the *De clericorum institutione* (*On the Education of the Clergy*) written in 819. In this work Rabanus has frequently drawn on St. Augustine (*On Christian Doctrine*) and Gregory (*Pastoral Care*). The treatise deals mainly with the training of the clergy, but Book III deals with education in general.

That Rabanus must have owed much of his influence to his ability as a teacher may be supposed from his hints on class management. He insists on respect for individuality. Methods must be varied according to the age, ability, and intelligence of the pupils. Subjects must be presented in a clear and concrete manner; verbosity must be avoided, and instruction must be terse and to the point. Above all, pupils must be trained to be independent. That much depends on the personality of the teacher has been pointed out, but disciplinary measures, while necessary, must be exercised with discretion according to individual character (*secundum qualitatem hominis sic debet temperari disciplina magistrorum;* and *disciplina cum discretione*). Among the pupils of Rabanus were many who attained fame as scholars and teachers in the next generation, the most prominent being Servatus Lupus, abbot of Ferrières, Walafrid Strabo, abbot of Reichenau, Gottschalk, and Rudolph, Rabanus's successor.

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RABELAIS, FRANÇOIS (1483–1553). — French humorist and satirist, significant for his influence upon the thought of Montaigne (*q.v.*), Locke (*q.v.*), and Rousseau (*q.v.*) rather than for any direct effect upon the education of his day. His early years are shrouded in mystery, and the first real evidence we have of his existence is when he was in the monastery at Fontenay-le-Comte (1519). Although a monk of the Franciscan and later of the Benedictine order, physician, lecturer in medicine and in anatomy, and writer, he is best known to us on account of his literary work as humorist and satirist. He was a friend of Budæus (*q.v.*) and of Du Bellays. His most famous writings were *Pantagruel* and *Gargantua*, the first parts of these being published in 1533 and 1535, respectively. Though these names are not original with Rabelais, and in fact were probably names of giants well known to the people of the Middle Ages, yet the treatment by the pen of Rabelais is so bold and so novel that he is often looked upon as their creator. In his educational philosophy, he was one of the early realists, in violent opposition to the prevailing scholastic formalism of his time, but yet unable to get away from the book as the chief source of his material. This twofold tendency, a realist as judged in the light of his contemporaries, a humanist in his faithfulness to classical and book learning, has resulted in the double characterization "humanist-realist." In *Gargantua*, the manners and education of the sixteenth century are satirized in the most ruthless fashion. The training under the old scheme is an utter failure, and Gargantua is "reëducated." The physical, the moral and religious, and the intellectual elements are all carefully included with special emphasis in this last category upon scientific instruction and sane method. We find here a complete exposition of his educational ideas.

F. E. F.

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RACE PROBLEM, EDUCATION AND THE. — See Immigration and Education; Industrial Education; Negroes, Education of; Southern Educational Movement; also the section on educational conditions in the various articles on the Southern States.

RACE PSYCHOLOGY. — That branch of social psychology which deals with the special characteristics of particular groups of people. Thus the sensory characteristics of primitive peoples may be investigated as a special topic in race psychology. Again, the peculiar social institutions of a given people may be contrasted with the peculiar social institutions of other nations at the same level of culture. The people of Eastern Europe have certain typical characteristics which differentiate them from the people of Western Europe. The science of ethnology deals with these and other racial differences. In so far as the differences with which ethnology deals are mental in character and are of psychological significance, the fields of race psychology and ethnology are coincident. Ethnology is a broader term, and includes also physical characteristics and the study of institutions beyond the strictly psychological institutions which would be included in race psychology. For a treatment of the broader problem and for references, see Social Psychology. C. H. J.

RADCLIFFE COLLEGE, CAMBRIDGE, MASS. — Systematic instruction of women by professors and other instructors of Harvard University began in 1879; and in 1882 the Society for the Collegiate Instruction of Women was formally organized. The work had no official relation with the University until 1894, when the name of the Society was changed, by act of the General Court of Massachusetts, to Radcliffe College. The President and Fellows of Harvard College have been constituted the Board of Visitors of Radcliffe College. The requirements for admission are identical with those for admission to Harvard College. The courses of instruction given in Radcliffe are for the most part identical with courses in Harvard, and are given by the same instructors. They are more than sufficient to enable a woman to perform the work required by the University for the degrees of A.B. and A.M. In addition to these, graduate students in Radcliffe have access to a large number of graduate courses in Harvard University. In several departments students have taken the Ph.D. degree. The number of teachers is 103. The examinations are the same in both institutions, and the diplomas conferring the degrees of A.B., A.M., and Ph.D. are countersigned by the President of Harvard University as a guarantee that these degrees are equivalent to the corresponding degrees given by the University. Mrs. Elizabeth C. Agassiz was the first President, and remained Honorary President until her death in 1906. She was succeeded in 1903 by Professor LeBaron Russell Briggs, Dean of the Faculty of Arts and Sciences of Harvard University. The first Dean of Radcliffe was Miss Agnes Irwin. She was succeeded in 1910 by Miss Mary Coes.

The Radcliffe buildings consist of two administration and lecture buildings, a library containing 25,000 volumes, a gymnasium, and three halls of residence. The students have access to the Harvard Museums, and have the use of the Harvard and Harvard-Andover Libraries. Opportunities for study in the Harvard Astronomical Observatory and the Herbarium are also afforded. In 1911–1912, 566 students were registered in Radcliffe. M. C.

RAFFIA WORK. — See Household Arts; Industrial Arts; Manual Training.

RAFINESQUE, CONSTANTINE SAMUEL (1783–1842). — Peripatetic schoolmaster and scientist; traveled and studied in Europe. He was an itinerant schoolmaster in the Mississippi Valley and for a time professor at Transylvania University. His studies of the botany and geology of the United States (some of them translated into French) represent the most extended and careful early scientific work done in America. W. S. M.

RAGGED SCHOOLS. — Institutions established in the British Isles for the education of destitute children, waifs, and strays who were not reached by other agencies or who were entirely neglected. The movement was begun largely in imitation of the work of John Pounds (*q.v.*). The schools were maintained by voluntary contributions, and in many cases the services of voluntary teachers were obtained. The aim of the schools was to give an elementary Christian education to children who would otherwise have grown up in utter ignorance and sin. By the side of the ragged schools many other activities for the social uplift of those whom they could reach were begun. Thus in connection with the Ragged School Union, established in London in 1844, there were maintained: Sunday schools, day schools, evening schools, penny banks, children's churches, parents' meetings, bands of hope, clothing clubs, ragged churches, messenger and shoeblack brigades, homes, industrial classes, etc. From 1856 the Committee of Council on Education in England gave a grant to ragged schools under certain conditions. Schools of this type sprang up all over the country and were established by different denominations. Their usefulness was largely destroyed when compulsory education was introduced after 1870. But they did a considerable service in training up as respectable, self-supporting citizens those who otherwise would have found no helping hand.

See Carpenter, Mary; Guthrie, Thomas; More, Hannah; Raikes, Robert; Sunday Schools.

RAIKES, ROBERT (1735–1811). — Promoter of the Sunday schools (*q.v.*), born at Gloucester, England. He became, on his father's death, editor and printer of the *Gloucester Journal*. From an early age he was much interested in social and philanthropic questions, and especially in prison reform. Through his study of the latter and his frequent visits to the working class districts of Gloucester, he saw the chief cause of degradation in the neglect of adequate training of children. In 1780 Raikes engaged a woman to take charge of a Sunday school for the depraved and vicious children. In 1783 he gave an account of his work in his *Journal*, and a letter of his on the subject was published in the *Gentleman's Magazine* in 1784. In 1783 Raikes became associated with Rev. Thomas Stock, who had already opened Sunday schools at Ashbury, Berkshire, and in Gloucester. The two engaged and paid the salary of three or four teachers to keep school on Sunday, and Raikes in addition paid to have the schools opened on week days.

Raikes attracted considerable attention by the accounts printed in his own paper and in the *Gentleman's Magazine*. He had many correspondents and many visitors, including the Duke of Gloucester. He was invited to St. Petersburg by Empress Catherine. In 1787 he was elected honorary member of the Sunday School Society, which had been established in 1785 and chose thus to honor the "Founder" of the movement. It would be difficult to establish the claim of Raikes to be the founder of Sunday schools. Undoubtedly he did good work and sacrificed much money and personal energy for the cause, but many others had labored quietly in the same direction both before and during his life. It was his good fortune to have the means of attracting attention at a time when interest was already being shown in the work elsewhere.

See Sunday Schools.

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RAILWAY SCHOOLS. — See Apprenticeship and Education; Industrial Education.

RAMBAULT, MARY LUCINDA BONNEY (1816–1900). — Founder of the Ogontz School; educated at Hamilton Academy and the Troy Seminary. She taught in secondary schools at Jersey City, New York City, Beaufort, S.C., and at the Troy Female Seminary. In 1850 she founded a secondary school for girls in Philadelphia, subsequently removed to Ogontz. She was one of the founders of the Indian Association. W. S. M.

RAMSAUER, JOHANNES (1790–1848). — A German educator, pupil of Pestalozzi, born at Herisan in the canton of Appenzell, Switzerland. In 1800 he was taken by Pestalozzi into his school at Burgdorf, and followed him later on (1805) to Yverdun, where he was promoted to the position of a teacher in the school and, at the same time, acted as Pestalozzi's private secretary. Thus for sixteen years he lived in closest communion with the master and imbibed his ideas. In 1816 he was appointed teacher in a newly established educational institution at Würzburg, but in the fall of that year he accepted a call of Queen Catharine of Württemberg to become the tutor of her two sons, and to direct an elementary school for children of the higher classes at Stuttgart. When, after the death of Queen Catharine in 1819, her sons removed to Oldenburg, Ramsauer went with them and continued to direct their education. He also established a school for girls which, in 1836, was merged with the Cäcilienschule, founded by Prince Peter. Ramsauer remained connected with this school until his death. He made valuable contributions to the methodology of freehand and geometrical drawing, but his chief importance lies in his splendid exposition of the work and character of Pestalozzi. Among his writings are *Zeichnungslehre* (*Instruction in Drawing*, 1821); *Elements of Geometry*, 1826; *Kurze Skizze meines pädagogischen Lebens mit besonderer Berücksichtigung auf Pestalozzi und seine Anstalten* (*Short Sketch of my Educational Career, with Special Reference to Pestalozzi and his Institutions*, 1838, 2d ed., 1880) and the *Book of Mothers*, published at the occasion of the one hundredth anniversary of the birth of Pestalozzi in 1846. F. M.

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RAMUS, PETRUS, OR PIERRE DE LA RAMÉE (1515–1572). — French humanist and educational reformer. He was born at Cuth, Picardy, of humble parentage, but worked his way through the College of Navarre, University of Paris. He conceived a high esteem for dialectic, but was disgusted with the formal and useless disputations through which it was taught, and soon broke with the Aristotelianism of the day. At his master's examination in 1536, he defended the thesis: "All that Aristotle has said, is false"; and in 1543, as principal of the College of Ave Maria, he crystallized his point of view on the negative side in his *Animadversions on Aristotle*, and on the positive in his *Divisions* (later, *Institutions*) *of Dialectic*. He was attacked by prominent, but pedantic, scholars; a biased commission of five decided that "Ramus has acted rashly, arrogantly, and impudently"; and the king prohibited the publication of his works and forbade him to lecture upon philosophy. Upon the accession of Henry II in 1547, however, the interdict was removed through the influence of the Cardinal of Lorraine, and, in 1551, greater latitude was afforded Ramus by his appointment to a new chair in the College of France. He had previously (1541) become principal of the College of Presles, and now undertook a revision of all the liberal arts, and published numerous works upon grammar (Latin, Greek, and French, as well as a general treatise), rhetoric, dialectic, mathematics (arithmetic, geometry, and general treatises), and physics (natural sciences). He also wrote treatises upon ethics and theology, and published his lectures on Cicero, Quintilian, Vergil, and Cæsar. In all, he issued fifty-two works, and ten others were published posthumously. He was noted for his eloquence, and several times represented the university before the king. In 1561 he succeeded in securing a renewal of university privileges and some of the arrears in salary for the professors in the College of France. In the same year he was converted to Protestantism. In his *Recommendations for the Reformation of the University* (1562), he held that the fees should be abolished, the large number of masters be replaced by a few public professors paid by the state, that instruction be made more practical, and that demarcation be made between secondary and higher education. These last two steps alienated the Cardinal of Lorraine and the faculties, and greatly strengthened his conservative opponents. Antagonism to him was increased by his opposition to the recognition of the Jesuit College of Clermont by the University (1564), and to the appointment of the incompetent Carpentarius to a chair of mathematics at the College of France (1566). Three times (1562, 1567, and 1568) he was driven into exile with his coreligionists. On the last occasion he was enabled to visit for two years the chief humanistic centers of Germany and Switzerland, and was received with the greatest consideration by all the most renowned scholars there. He returned in 1570, but his enemies had him excluded from teaching, although it was finally arranged that he should retain his salary and devote himself to writing. He was most brutally murdered during the massacre of St. Bartholomew's Day.

Ramism. — The chief aim of Ramus in education was to free the liberal arts from barrenness and needless difficulties. The principles underlying his reforms may be summed up in three key words: (1) nature, (2) system, and (3) practice. His guide for the selection of subject matter was the observation of *nature*. The material for grammar, he held, should be derived from actual usage, — the ancient tongues from the classical writers, and the modern from the speech of the people. Logic should be based upon the observation of the human mind, and natural sciences upon the investigation of physical nature. *System*, or arrangement of subject matter, he founded upon the following principles taken from Aristotle: (*a*) *universality* (κατὰ παντός) or "the law of truth," whereby every precept must be true in all instances; (*b*) *homogeneity* (καθ' αὑτό), or "the law of justice," whereby everything must be germane to the particular subject; and (*c*) *primacy of the general* (καθ' ὅλον), or "the law of wisdom," whereby anything that obtains throughout a subject should be stated at the outset and only then. In method Ramus arranged a plan of work through which abundant time should be given to careful explanation, insuring a knowledge of the principles and meaning of each lecture, and applying them in *practice*. There were two aspects to "practice," (*a*) *analysis*, or critical examination of the way in which a passage conforms to the rules, and (*b*) *genesis*, or production at first of something akin to the model, and later more independent creation. In each subject he established the practical goal of *use*, and made his definition of it from that standpoint. His organization of the "arts" rested upon *dichotomy*, or a division of each portion of subject matter into two parts. His *grammar* included only "etymology" and "syntax." In this "art" he sought to establish the use of *j* and *v* to represent the consonant sounds up to that time included in *i* and *u*, to improve pronunciation and to introduce phonetic spelling. *Rhetoric* was divided into "expression" and "action," and under the former he included "prosody," which he had rejected from grammar. He sharply separated rhetoric from grammar on the one hand, and from dialectic on the other, excluding equally "syntax," and "invention," and "arrangement." Dialectic was treated more as the art of persuasion and exposition than of the discovery of truth, and he held that it could be learned better by observing Cicero's usage than by studying the canons of the *Organon*. He held it to be simply the practical art of debating a question, and refused to consider any of the preliminary metaphysical problems. He recognized the ten chief classes of arguments of Aristotle, and adopted his first three figures, but rejected the fourth. In arithmetic and geometry he eliminated all complexities. His geometrical demonstrations were clear and well arranged, and for the first time appeared in the form of demonstrations. He advocated that *physics* be studied from nature and philosophical abstraction be avoided, but actually he borrowed his material from Aristotle's *Physics*, Pliny's *Natural History*, and Vergil's *Georgics*, and arranged it deductively.

Influence. — Ramism was debated throughout Western Europe for more than a century, and left a great impression upon philosophical and educational thought. It found many advocates in France and influenced the work of Descartes and the Port Royalists. It had a little following in Spain, Portugal, and Italy, and much enthusiasm arose from its introduction into Denmark by Krag, and into the Low Countries by Nancel. In England it made little progress at Oxford, which was devoted to Aristotle, but Cambridge, through the efforts of Ascham, proved hospitable. It was given vogue there by Digby, the tutor of Bacon, and Milton published a treatise upon it. The Count of Murray, regent of Scotland, who had been a pupil of Ramus, popularized it there. In Switzerland it was openly professed at most of the cities by such men as Arminius, Zwinger, and Freigius. It exerted its greatest influence in the German states, where it was aided by university rectors, like Sturm, Fabricius, and Chrytræus, and the chair of philosophy at nearly all Protestant institutions came for a time to be held by a Ramist. The Lutherans, however, suspecting that it was an outgrowth of Calvinism, opposed to it the dialectic of Melanchthon, and fierce contests arose, which eventually crowded it out. F. P. G.

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RANDALL, SAMUEL S. (1809–1881). — Superintendent of schools; educated at Oxford Academy and at Hamilton College. He taught in the public schools of New York State; was for many years deputy state superintendent of public instruction, and from 1851 to 1870 was superintendent of schools of New York City. His educational publications include *History of the Common School System of the State of New York; Principles of Popular Education;* and *Mental and Moral Culture.* He was editor of the *District School Journal* from 1845 to 1852. W. S. M.

RANDOLPH-MACON COLLEGE, ASHLAND, VA. — The oldest college in the country under Methodist auspices. In 1830 a self-perpetuating body of trustees was incorporated and chartered by the General Assembly of Virginia in response to a suggestion of the General Conference of the Methodist Episcopal Church, to establish "a seminary of learning for the instruction of youth." A college for men, named after John Randolph, of Roanoke, and Nathaniel Macon, United States Senator from North Carolina for thirty-seven years, was established at Boydton, and the first class was graduated in 1835. The college was moved to Ashland in 1868. In 1890 the Board of Trustees obtained an amended charter with power to "erect, establish, and maintain . . . schools, academies, or other institutions of learning for the instruction of the youth of the land." As a result, the Randolph-Macon System of colleges and academies was established with the following institutions: Randolph-Macon College at Ashland, for men; Academies for boys at Bedford City (1890) and Front Royal (1892); an Institute for girls at Danville (1897), and the Randolph-Macon Woman's College at Lynchburg (*q.v.*), 1893. William W. Smith, A.M., LL.D., is Chancellor. The college at Ashland gives courses leading to the degrees of A.B., B.S. and A.M. The requirements for entrance are fourteen units of high school work. The faculty in 1911–1912 consisted of seventeen members, and the student enrollment was 161.

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RANDOLPH-MACON WOMAN'S COLLEGE, LYNCHBURG, VA. — An institution for higher education of women founded by subscription of the citizens of Lynchburg and placed under the care of the Randolph-Macon Board of Trustees. (See Randolph-Macon College, Ashland, Va.) The college was opened in 1893 and has rapidly risen to a leading position among women's colleges, being placed in "Division A" in the *Report* of the United States Commissioner of Education (1910). The entrance requirements are fifteen units of high school work. The courses in the college lead to the degree of A.B. and A.M. In 1906 the college was admitted by the Carnegie Foundation to the retiring allowance system, but was removed in 1909, since the board of trustees remained denominational under the Virginia Conference of the Methodist Church, South. The faculty in 1911–1912 consisted of forty-six members and the student enrollment was 576.

RASH. — See Infectious Diseases.

RATE AID FOR EDUCATION. — See England, Education in.

RATE BILL. — The term given in America during the eighteenth and early half of the nineteenth century to the school fees collected from the pupils. Such "rates" were often established and the amount determined by law. See Fees; Free School.

RATIO AND PROPORTION. — Although the idea of ratio is probably prehistoric, since it involves only such a concept as "twice as large," or "half as large," the subject is first met in mathematics in the *seqt* of the Egyptians, a certain ratio perhaps corresponding to our tangent of an angle. It is first found as a prominent feature in mathematics in the school of Pythagoras (*q.v.*). Pythagoras was so much interested in the musical notes formed by strings that were altered in a given ratio that the Greeks occasionally relegated the subject to the domain of music. Eudoxus (*q.v.*), however, treated it as a part of geometry, and probably wrote the fifth book of the "Elements" of Euclid (*q.v.*), wherein the subject is discussed. Nicomachus (*q.v.*), on the other hand, included it in his arithmetic. Among those who made it a part of the theory of music may be mentioned Theon of Smyrna (fl. about 140 A.D.). The fact that in general the Greeks did not conceive of ratios as numbers, but rather as relations, is the reason for such terms as "duplicate ratio," "compound ratios," and the like. The use of the term *ratio* in the present sense is relatively modern. In Latin the word was commonly employed to mean computation. For the idea which we express by $a:b$ the late Latin writers used the word *proportio*, using *proportionalitas* as we would now use proportion. Thus in speaking of what we would now call ratio and proportion they used the equivalent of proportion and proportionality. So we have in a manuscript of Campanus, a well-known mathematical writer of the thirteenth century, a chapter "De proportione et proportionalitate." The title of the great work of Paciuolo (*q.v.*) furnishes another illustration of this usage, containing as it does the words "Proportioni et Proportionalita." This accounts for the expressions that are still heard, "Divide this in the *proportion* (instead of *ratio*) of 2 to 3," and "What is the proportionality of these numbers?" While *proportio* and *proportionalitas* were used in these senses, *ratio* was often used to indicate fractional relations, and numerous ratios had special names. For example, there were multiple ratios ($na:a$), superparticular ratios ($n+1:n$), the sesquilatera ($3:2$), and so on. Of such terms we have only the ratio of greater and of less inequality remaining, and even these are found only in a few algebras.

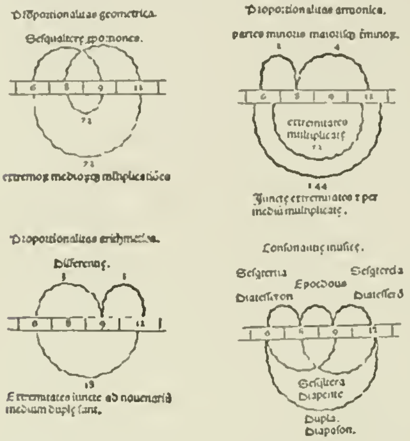
The ancients considered several kinds of proportion, including the following:—

arithmetic, $b - a = d - c$;
geometric, $a:b = c:d$;
and harmonic, $\frac{1}{b} - \frac{1}{a} = \frac{1}{d} - \frac{1}{c}$.

These are seen in the following illustration, from the first edition of the arithmetic of Boethius (*q.v.*).

Of these and various others only the geometric proportion has remained. This form has, however, kept several of the ancient names, such as proportion by composition, by division, by alternation, and so on, terms that have lost all of their original significance and that have already been banished from arithmetic, being found only in geometry and occasionally in algebra. These terms will soon disappear, there being no good reason for their retention.

Proportion having grown up as a part of geometry, a somewhat analogous form grew up in the Rule of Three, a rule of business arithmetic. In such an example as the one requiring the cost of five things when the cost of four things is known, there are given three terms from which the fourth is to be found. The Hindus spoke of the rule as the Rule of Three and they gave the fanciful names of Argument, Fruit, and Requisition to the three given numbers. When the rule found its way into Europe, it brought its Hindu name with it, this being variously translated. For example, the early Italian arithmetics usually had a chapter "De regole del tre"; the early French works had a chapter on "la rigle de troys"; the Latin books had one "De regula trium rerum," or on the "Regula de tribus"; and the German writers spoke of "Die Regel de Tri" or the "gulden Regel." These early forms were modernized with their respective languages, and "regula aurea," "clavis mercatorum," and other names were also given to the rule. It was not until the sixteenth century that writers of prominence began to recognize the identity of proportion and the Rule of Three, and not until the nineteenth century was this identity generally conceded by the schools.


Proportionalitas geometrica.
Sesquialtere proportiones.
6
8
9
12
72
72
extremorum mediorumque multiplicatione
Proportionalitas armonica.
partes minoris maiorisque terminorum.
2
4
6
8
9
12
extremitates multiplicate
72
144
Iuncte extremitates et per medium multiplicate.
Proportionalitas arithmetica.
Differentie.
3
6
8
9
12
18
Extremitates iuncte ad novenarium medium duple sunt.
Consonantie musice.
Sesquitertia
Epogdous
Sesquitertia
Diatesseron
Diatesseron
6
8
9
12
Sesquialtera
Diapente
Dupla.
Diapason.

Besides the Rule of Three there were analogous rules, such as the Rule of Five, the Rule of Seven, and so on. These all finally ran into Compound Proportion, a subject that has happily nearly disappeared.

Of late it has been recognized by the schools that a proportion is little more than a cumbersome form for an equation, and that, as a subject for arithmetic, at least, it has served its purpose and must be discarded. The proportion

$$x:a = m:n$$

is only another way of writing

$$\frac{x}{a} = \frac{m}{n},$$

or

$$x = \frac{am}{n}.$$

On this account we may expect to see the simple equation make more progress, and proportion lose its former standing. It seems reasonable to expect that the arithmetics of the near future will contain chapters on the simplest form of the linear equation, but little or no work in proportion. In algebra a similar change is liable to take place, and probably also in geometry. The ratio that we have in similar figures can be treated as a fraction with rational or irrational terms, and the ratio notation (:) will probably come to be merely a symbol of division, as it is in most European countries, changing its significance for somewhat the same reason that the old symbol of proportion (::) has given place to the sign of equality.

Where proportion is now taught it is best treated as an equation, without any such artificial rules as "cause and effect," rules that were devised in the middle of the nineteenth century. Compound proportion is already practically a thing of the past. D. E. S.

RATIO STUDIORUM. — The "Method of Study" of the Jesuit Order (*q.v.*).

RATIONAL METHOD. — A term used as a trade name for textbooks incorporating a special method of pedagogical procedure said to be based on rational or scientific as opposed to traditional principles of teaching. H. S.

RATIONALISM. — In its technical philosophic usage, this term stands for a theory regarding the origin of knowledge opposed to empiricism. It holds that the source and final test of knowledge and truth are not found in experience, which is identified with sense-perceptions or the impressions which things make on the mind, but in certain rational principles, or ultimate concepts. These are variously viewed in different rationalistic systems. Some take them to be innate in the mind; others as pure intuitive principles immediately discerned by the mind, while the Kantians regard them as transcendental categories which are aroused into action by the stimulation of sense, and which then operate to synthesize what would otherwise be a chaotic manifold into orderly objects and connected groups of objects. Kant thought he had reconciled empiricism and rationalism. He conceded to the former that all knowledge originates with and from experience, and that in no case can knowledge transcend the limits of experience, or phenomena in space and time. On the other hand, rational *a priori* principles, certain general functions of logical or conceptual thought, are necessary in order that there may be any such thing as objective experience, so that a rationalistic factor was also introduced. In the nineteenth century, Herbert Spencer attempted a conciliation of empiricism and rationalism on quite a different basis. He held that space and time, causation and certain moral beliefs, are *a priori* for the individual, but that these rational intuitions can be shown, on grounds of evolutionary science, to be the consolidated accumulated results of racial experience.

In its more popular usage, rationalism stands for reliance upon reason as distinct from faith. This meaning of the term goes back to certain tendencies to rationalize Christian theology found in medieval philosophy; but the special vogue of the conception dates from the controversy between the deistic upholders of natural religion in the eighteenth century and their orthodox opponents who upheld the claims of supernaturally revealed religion, including miracles. In this particular sense of the term rationalism, empiricism itself was rationalistic, at least in its more current forms. On the other hand, there are a few types of empiricism which admit, on grounds of experience, a mystical factor, and such empiricisms are allied with doctrines of faith as an instrumentality of knowledge. Contemporary discussion evinces tendencies to use the term rationalism in a third sense, namely, to denote theories which conceive experience to be purely intellectual or cognitive in character, and which reduce emotions and volitions to combinations of cognitive elements or processes. Intellectualism, as distinct from voluntarism, would seem, however, to be a better term for this meaning. J. D.

RATKE (RATICHIUS), WOLFGANG (1571–1635). — One of the pioneers of modern pedagogy, was born at Wilster, a small town in Holstein, and received his general education at the Johanneum in Hamburg. He then studied theology at the university of Rostock, without, however, attaining any academic degree. From 1600 to 1603 he lived in his home town, engaged in the study of languages, particularly of Hebrew. Owing to his inability to speak in public, he had given up the idea of becoming a minister and turned his attention to a reform of education, especially with regard to the instruction in languages. He went to Holland, and, as a private teacher in Amsterdam (1603–1610), he first made a practical application of his ideas of teaching languages. He put his plans for a reform of education before Prince Maurice of Orange, the Stadholder of the United Netherlands, who was willing to have the new method tried, but only in the instruction of Latin. This did not satisfy Ratke, and he therefore returned to Germany, where, in 1612, he presented his plans to the German princes assembled at the Imperial Diet at Frankfort. His ideas embraced not only a reform in the teaching of languages, but also the replacing of Latin as the medium of higher education by the vernacular, and the bringing about of unity throughout Germany. He succeeded in interesting Duke Ernest of Saxe-Weimar, the Landgrave of Hesse, and other princes, as well as in gaining the approval of the universities of Giessen and Jena. Two professors of Giessen, Helwig and Junge (*q.v.*), even gave up their positions to devote themselves entirely to the writing of textbooks in accordance with Ratke's ideas. When, in 1614, he was called to Augsburg, both of them followed him to assist in the reformation of that school system. They, as well as other collaborators of Ratke, were bound to secrecy with regard to his methods and had to promise not to publish anything about them without his consent. The Augsburg experiment, followed by others in Cöthen (1618–1620) and Magdeburg (1620–1622), failed. These failures were due partly to sectarian controversies, partly also to the personality of Ratke, who lacked tact and organizing ability, but most of all to the novelty and greatness of his plans, which needed time and the training of a new generation of teachers to bring them to fruition.

He remained, however, active in the promulgation of his principles to the end of his life. He had a powerful and steadfast protector in Countess Anna Sophie of Schwarzburg, who took Hebrew lessons from him and interested the great Swedish Chancellor Oxenstierna in his behalf. Ratke was willing to enter into Swedish service, but a stroke of paralysis, in 1633, which deprived him of the use of his tongue and right hand, made this impossible. He died at Erfurt in 1635.

While the direct practical success of Ratke's life work was small, and while it was overshadowed by the greater work of Comenius (*q.v.*), great credit is due to him for first enunciating some of the fundamental principles of modern education. Chief among these are the principles that everything should be done in its natural order or in the course of nature, and that one thing should be mastered at a time. Other ideas of his, important as reformatory influences and as permanent truths, may be enumerated as follows: each thing should be often repeated; everything first in the mother tongue; everything without compulsion; nothing to be learned by rote; mutual conformity in all things (*i.e.* comparative grammatical study of the languages); first the thing itself, and afterward the explanation of the thing; all things through experience and investigation or experiment. The last of these contains the essentials of the Baconian reforms; the next to the last, the essentials of the Pestalozzian reforms; all of them are foreshadowings of the Comenian reforms. F. M.

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RAUHE HAUS, DAS. — A juvenile reformatory established at Horn, near Hamburg, in 1833 by J. H. Wichern (*q.v.*) for the vagrant and vicious children of Hamburg. Wichern organized it on the family or "cottage" principle with from twelve to sixteen boys or girls in a family. They were placed in charge of "Brothers" or "Sisters," who were to act as constant companions of the young people. They were given an industrial education. In 1852 there was added a boarding school, now recognized as a *Real* School for unmanageable boys of better families. The system of the Rauhe Haus has been copied elsewhere in Germany, and from the "Brothers" have gone forth many who have taken part in the work of prison reform and other philanthropic rescue work.

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RAUMER, KARL GEORG VON (1783–1865). — German mineralogist and historian of education, was born at Wörlitz, near Dessau, in the duchy of Anhalt, and received his education, together with his brother, the famous historian Friedrich von Raumer, at the Joachimsthal gymnasium in Berlin. In 1801 he entered the University of Göttingen to study law, but he also attended lectures on mathematics and biology, and in 1803 he went to the University of Halle, and afterwards to the Mining Academy at Freiberg, where he received much inspiration from the great geologist Werner. Having determined to devote himself to the sciences of mineralogy and geology, he went to Paris (1808–1809) in order to study the magnificent scientific collections which could be found in the Paris museums. Influenced by Fichte's (*q.v.*) *Addresses to the German Nation* and the works of Pestalozzi, Raumer came to the conclusion that the salvation of Germany could be attained only by the education of the people, and that it was his duty to devote himself to this task. He left Paris and went to Yverdun to make a thorough study of Pestalozzi's principles and methods. Dissatisfied with the conditions he found there, he returned after a few months to Germany and published his first work, *Geognostische Fragmente* (1810), which gained

for him the professorship of mineralogy in the University of Breslau (1811). At the beginning of the War of Liberation he voluntarily entered the army and took part in the battle of Leipzig as the aide of Gneisenau. After the war he returned to Breslau, but his democratic ideas, especially his connection with the "Turners," brought him into conflict with the government, so that he first, in 1819, removed to the University of Halle, and finally in 1823 resigned his professorship. He now became a teacher, and later the principal, of a private school in Nuremberg, where he also founded an institution for delinquent boys. In 1827 he reëntered the public service, being appointed professor of mineralogy in the University of Erlangen, Bavaria. In this position he remained until his death. In addition to his regular duties, both at Halle and at Erlangen, he delivered lectures on pedagogy, the outgrowth of which was his *Geschichte der Pädagogik vom Wiederaufblühen klassischer Studien bis auf unsere Zeit* (*History of Pedagogy from the revival of classical learning down to our time*). The first and second volumes appeared in 1843, the third in 1847, the fourth in 1855; a recent edition was published in Langensalza in 1897. The work has been made familiar to American readers through translation in Barnard's *American Journal of Education.*
F. M.

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RAUMER, KARL OTTO VON (1805–1859). — Prussian Minister of Education, born at Stargard in Pomerania, attended the gymnasium of Stettin, and studied jurisprudence at the universities of Göttingen and Berlin. He entered the Prussian administrative service, where, in 1845, he rose to the position of *Regierungspräsident.* Being known as a man of the strictest conservative principles, he was called as Minister of Education into the reactionary government formed by Manteuffel in 1850. There it was his chief object to counteract the liberal tendencies of the Prussian schoolmasters, which had become prominent in the revolutionary movements of the year 1848. He issued the famous *Regulative* (school regulations) of 1854, through which the preparation of teachers and the course of study of the elementary schools was restricted to a minimum. In consequence of the opposition aroused by these measures, he resigned in 1858.
F. M.

RAY, JOSEPH (1807–1857). — Author of mathematical textbooks; educated at the Ohio University. He was instructor in secondary schools in Ohio and principal of the Woodward High School at Cincinnati. He was the author of numerous arithmetics, algebras, and other mathematical school books. From 1854 to 1857 he was editor of the *Ohio School Journal.*
W. S. M.

RAYMOND, JOHN HOWARD (1814–1878). — Second president of Vassar College (*q.v.*); graduated from Union College in 1832. He studied law and was admitted to the bar, but never practiced. Later he studied theology. He was professor at Madison University (1840–1850) and the University of Rochester (1850–1855). He was president of the Brooklyn Polytechnic Institute (1855–1865) and of Vassar College (1865–1878). He was the author of various papers on educational subjects.
W. S. M.

REACTION. — See Reaction Experiments.

REACTION EXPERIMENTS. — By a reaction is meant the response to an external stimulus by means of a movement. A reaction experiment consists in some type of control of the conditions under which the response is made. Following a broad classification, we may distinguish three uses that have been made of the experiment.

Measurement of Reaction. — The problem of measurement has in general taken four forms. (*a*) The time required to respond to a sensory stimulus by means of a movement has been determined. This, the earliest form of the experiment, was devised by the astronomers in the effort to discover why their records of the transit of a star did not agree from observer to observer. It is characteristic of the period ranging from the dismissal of Kinnebrook by the astronomer royal (Maskelyne), 1796, to about 1850, when Helmholtz discovered a method of measuring the velocity of a nerve current. During this period not only were the differences in the reaction time of different observers recorded, but some attempt was made to find out upon what these differences depend. (See Sanford, Bibliography of "personal equation," *Amer. Jour. of Psychol.*, 1888, II, pp. 424–430.) (*b*) The velocity of the nerve current has been estimated. The method, introduced by Helmholtz and improved by himself and others, consists in exercising a muscle with a long stretch of nerve attached, and connecting the muscle with a lever, so that its contractions are registered upon a quickly moving surface. By electrical stimulation of the nerve at points near to and far from the muscle, two curves are obtained, the latter of which is found to begin a trifle later than the former. A tuning fork, writing its vibrations beneath these records, shows how much later the second contraction began than the first. The rate, for both motor and sensory nerves in man, is commonly estimated at about 30 m. per second. Dolley and Cattell (1894), however, think it is much greater. (*c*) The time required for a sense organ to respond to its stimulus, or the "inertia of the sense organ," has been measured. Attempts have been made in vision to determine this interval for both colored and colorless light by Exner, Brücke, Kunkel, Dürr, and others. Work which might be considered as falling under the same head has been done in audition, for both tone and noise, and in pressure. Time of movement is excluded from these results, and the methods are so arranged as to limit the interval, as closely as possible, to the time elapsing from beginning of excitation to maximum of sensation. (*d*) The time required for the exercise of simple mental functions has been estimated. The determination is based upon the principle that, if the time of simple reaction for a given observer is known, a rough estimate of the time required for the exercise of simple mental functions may be obtained by taking the reaction time when these functions are superadded, and comparing the result with the simple reaction time. Distinction and choice, limited and unlimited association, and comparison, are examples of the simple mental functions that have been studied. Reactions involving distinction and choice were first used by Donders and his pupils, 1865-1867. White and red lights were used as stimuli, and the observer was required to react to the one light with the right and to the other with the left hand. In later experiments attempts have been made to get separate time-values for distinction and choice. This is done by comparing the results of experiments of the Donders type with the results of experiments involving a distinction between a series of stimuli but no choice as to the type of reacting movement. An example of limited association is found in the simple question and answer. Here nothing but simple remembering is involved, and the association is limited by the nature of the question. The unlimited association has been more frequently investigated than the limited. The observer is given a word, and is required to report the first word that comes into his mind in association with it. In both of these cases of association, the "pure association time" is reckoned as the total time *minus* the sum of the simple reaction time and the time required to report the word. The reactions involving comparison have usually taken the form of question and answer, the answer requiring some comparison of a greater or less degree of complexity. It is obvious from the foregoing that the variations that can be given to this form of the reaction experiment are very numerous. Work has continued from the experiments of Donders to the present time. It seems to have reached its culmination, however, in the late seventies and the early eighties of the last century.

The Factors that Influence Reaction Time.—Space will be taken here only for the briefest account of the factors that influence the simple reaction. For the factors that influence the reaction complicated by the addition of one or more mental functions, see J. Jastrow, *The Time Relations of Mental Phenomena*, 1890; and K. Fricke, *Biol. Centralbl.*, 1889, Vol. VIII, 673; 1889, Vol. IX, pp. 234, 437, 467. (*a*) *The kind of stimulus and the sense organ stimulated.* Since the time required for the different sense organs to respond to stimulation varies, we should expect a corresponding variation in the reaction time. Jastrow averages the results reported by a large number of experimenters, and finds the time for hearing, 138σ; for pressure, 148σ; and for vision, 185σ. Vintschgau and Steinach report the time for pressure on various parts of the head, 109σ; for cold, 135σ; and for warmth, 146σ. Similar values for various points on the hand are 121σ, 188σ, and 209σ. Goldscheider made the difference in time for warmth and cold still greater. Moldenhauer finds the reaction time to smell to average about 300σ. Hönigschmied finds for taste on the tip of the tongue values ranging, for different observers, from 182σ to 300σ. On the back of the tongue the time is longer. It is longest for bitter, shortest for salt, and about equal for sweet and sour. Exner reacts to electric stimulation on the back of the hand in 132σ, on the forehead in 137σ, and on the foot in 175σ. Wittich reacts to stimulus on the back of the finger in less time than on the front. Hall and von Kries find a longer reaction time for the peripheral than for the central retina. High tones are reacted to more quickly than low tones. (*b*) *Intensity of the stimulus.* Exner and Kunkel have found that the time required for a sense organ to respond to its stimulation decreases with increase in intensity of the stimulus. Correspondingly, the reaction time has been found to decrease with increase in the intensity of the stimulus. Wundt obtained this result in the case of sound stimuli; Exner, in that of light stimuli; and Berger and Cattell for light, electrical-cutaneous, and sound stimuli. In reactions to the liminal intensity of various sense stimuli, Wundt obtained an approximately constant result. (*c*) *Mode of reaction.* The time varies with the type of reacting movement. Münsterberg, reacting with four fingers, found that at first the thumb and little finger responded less quickly than the others; practice, however, reduced the difference to a minimum. Féré reports that the fingers executing the strongest movements give the shortest reaction times. Vintschgau and Cattell show that reactions by the fingers are quicker than by the voice. Results have been obtained, also, which seem to show that movements made by the right side of the body are quicker than those by the left. These results, however, cannot be considered uniform. Smith, and Judd and McAllister have proved that the reacting movement is not simple.

Sometimes an antagonistic movement, sometimes a partial reaction, sudden or gradual, precedes the true reaction. (*d*) *Age of the observer.* Binet has shown that children from three and one half to seven years react more slowly than adults. The very old also react more slowly than those in the prime of life. (*e*) *The mental and physical condition of the observer.* Obersteiner, Vintschgau, Goldscheider, and others find that mental and physical fatigue, worry, or slight indisposition, causes an increase of thirty to forty σ in reaction time. Fatigue induced by the experiment itself is also of effect. With a simple natural reaction Cattell has shown, however, that fatigue is very slow to appear. The effect comes, apparently, as a difficulty in concentrating upon the experiment. The time of reaction is lengthened, but the influence is manifested chiefly as an increase in the mean variation of the results. (*f*) *Practice.* The effect depends to a considerable degree upon the mode of reaction. The influence is strongest at first, and decreases as the mode of reaction is learned. Cattell finds that, when the movement is once thoroughly learned, a rest of three months does not affect reaction time. Trautscholdt, however, asserts that a slight increase in reaction time marks the beginning of each day's work. Wundt lays stress upon the necessity of maximal practice for the determination of representative values and their variability. Alechsieff finds a great reduction as a result of practice in the simple reactions, sensory and motor, to light; and Bergmann, in those to sound. (*g*) *Voluntary direction of attention.* When attention is directed to the sense impression, the reaction time is found to be longer than when it is directed to the movement. The first type of reaction is called the "sensory" reaction, the second the "motor" reaction. Lange showed that the time required for the sensory reaction to an auditory impression averages 227σ, motor 123σ; to a visual impression, sensory 290σ, motor 113σ; to a tactile impression, sensory 213σ, motor 108σ. This difference, however, is believed to be extreme by Münsterberg, Martius, and Dwelshauvers. The motor type of reaction has the smaller mean variation. Differences in result are no doubt due, in part, to the difficulty in maintaining the constancy of the type of reaction; there seems to be a tendency, varying with individual reactors, for the sensory to pass over into the motor type. The individual differences found since the days of Bessel may also be due, in part, to a natural tendency to direct the attention in the one way or the other. (*h*) *The action of drugs and the influence of mental and nervous disorders.* Exner found that wine decreases the reaction time; Vintschgau and Dietl, that coffee decreases and morphium increases the reaction time. Kraepelin and Orchansky affirm that alcohol decreases the reaction time for a short period, and then increases it for a long period. A change in the reaction time of the insane has frequently been observed: melancholia probably lengthens, mania shortens, the reaction time. In general paralysis, Obersteiner finds a rapid increase from incipient to advanced stages of the disease. Hall has found a marked decrease in hypnosis, but this result has not been corroborated by others.

Applications. — The experiment has been used for the study of the action of consciousness under laboratory conditions. This application of the experiment was suggested by Külpe, and has been indorsed by Wundt, Titchener, and others. The experiment may take many forms: the conscious antecedents and concomitants of movement may be studied under a wide range of conditions; correlations may be made between the force, rapidity, extent, etc., of movement and its conscious antecedents and concomitants; the mean variation and the time of movement may be studied in relation to variations in the antecedent of the movement; and so on.

The reaction experiment has also served miscellaneous purposes. For example, Cattell has used it as a means of estimating the differences between the intensity of sensations; Münsterberg and Bush, for determining the just noticeable difference of intensity; and Henmon, for testing color sensitivity. It has besides been applied in tests of school children, in tests of efficiency, and in tests of criminals, the mentally deranged, and the lower animals. At the present time, two specific applications are in the forefront of discussion. The association reaction, and derivatives from it, have been employed by Külpe and the Würzburg school for the analysis of the processes of thought, and have led to the discovery of an alleged "thought element" of consciousness. In a very different way, the same association reaction is turned to account by Jung and the Zürich school for the discovery of emotive "complexes" in the minds of their reactors; an unusually long reaction time to a suggestive word is taken as the symptom of an emotive disturbance which may, *e.g.*, betray complicity in a crime.

C. E. F. and E. B. T.

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REACTION TIME. — See Reaction Experiments.

READING. — See Literature, Children's; Literature, English; also Composition; Nursery Rhymes, etc.

READING, CHILDREN'S. — See Literature, Children's.

READING CIRCLES. — As found in the United States these are of three kinds: (1) those of the Chautauqua type, open usually to any adult; (2) those intended primarily for public school teachers; and (3) those intended primarily for public school pupils. The first form has been fully treated elsewhere. (See Chautauqua Movement.)

Teachers' Reading Circles. — The teachers' reading circle idea is an adaptation of the Chautauqua idea to the needs of public school teachers. In 1878 the Chautauqua Society first provided courses for public school teachers, and that same year the Chautauqua Literary and Scientific Circle was organized. In 1882 a paper, read before the Ohio State Teachers' Association, suggested the application of the Chautauqua idea to the improvement of teachers in service, and by the teachers themselves, and in 1883 the first Teachers' Reading Circle was organized, in Ohio. The Indiana State Teachers' Association provided for the organization of a similar circle in 1883, and the movement has since spread almost all over the United States. Thirty-seven states now have such organizations, nearly one half of which have been organized since 1900. In most of the states the State Teachers' Association has been the active agent in organizing and perfecting the reading circles, though in a few states the reading circle has been adopted by the state and is under the control of the state educational authorities. In twenty-seven states the work done in the reading circles counts as a part of the work for a teachers' certificate. In a number of the circles, courses of reading and study covering two or three years are laid out, and diplomas are granted by the circles to those who complete them. Three or four books are usually adopted for reading and study each year, helpful outlines are issued, and frequently the work done is discussed at the township or county institutes. For many years the books adopted were largely historical, literary, or cultural in type, but within recent years there has been a marked tendency to adopt books of a higher professional grade. The different circles have rendered an important service, particularly to the untrained rural teacher, and with the changing character of the work in recent years they will doubtless continue to render much valuable service. (See Teachers, Training of; Institutes.)

Pupils' Reading Circles. — These are a later development of the teachers' reading circle idea. Most of the states having teachers' reading circles have also developed similar reading circles for the pupils in the elementary schools. These are usually under the same management and control as the circles for teachers. The books selected for the pupils are divided into a number of grades, suited to the needs of pupils of different ages, and usually beginning with the pupils in the third or fourth grade. The books are on sale to any pupils desiring to have their own copies, and a sufficient number of sets is purchased to supply each schoolroom with one or more of the books. The pupils are then induced, by various means, to read these books each year. To establish early the habit of reading good books is regarded as one of the most important aims of the work, and the results in general have been very good. This branch of the work is also likely to be expanded more in the future. E. P. C.

For England, see National Home Reading Union.

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READING, HYGIENE OF. — The special hygienic aspects of reading may be stated very briefly. Four things are to be especially considered: (1) reading in relation to the voice; (2) reading in relation to the eye; (3) reading in relation to posture; (4) reading in relation to the mental habits formed.

(1) *Reading in Relation to the Voice.* — Oral reading from the hygienic point of view may be looked upon as a special form of gymnastics, and all the well accepted rules in regard to the exercise of any physical organ — adaptation to the physiological stage of development, care for regular exercise, and care to avoid overstrain — are to be considered. More concretely the rules are much the same as for the hygiene of the voice in general, and special care should be taken for proper breathing, to avoid speaking too loud, stammering, stuttering, and the like. Such neuroses seem liable to be caused by premature exercise in the more complex vocal acquisitions. Dr. Hartwell found a great increase in the number of cases of stutterers during the first years of the school work, when the early lessons in reading are being given. Such defects are often due apparently to improper methods of instruction.

(2) *Reading in Relation to the Eye.* — The activity of the eye in reading has been considered above, but it is important that special care should be taken to avoid all injurious conditions. The well accepted rules for the hygiene of the eye should be observed, and, as regards reading, especially the following rules: (*a*) A proper posture, with head erect, should be insisted upon; and suitable seats and desks

are necessary. (*b*) The book should be held at a distance of at least twelve inches from the eyes. (*c*) The instruction should be so divided that the eyes are used continuously but a short time for near work. In the first years of school life the time should not be longer than fifteen minutes, in the adolescent years not more than half an hour. (*d*) There should be frequent change of tension by looking at distant objects. (See Eye.)

The norms as regards textbooks have been summarized by the Committee of the American School Hygiene Association as follows: —

(*a*) The paper should be unglazed, free from shine, and opaque.

(*b*) The eye moves by a succession of movements and stops, and a long backward sweep to the beginning of the next line.

Fatigue is markedly increased by the difficulty of the backward movement and of locating the beginning of the next line if the line is too long. The maximum of safety is 90 mm., and 60 mm. to 80 mm. is better.

(*c*) The margin should be sufficient so that the eye, in the backward movement, does not *swing off* the paper; and the inner margin should be wide enough so that the inner end of the line is not obscured by the curvature of the paper.

(*d*) The size of the type should be as follows: —

1. Adult's standard. — (*i*) The height of the small letters should be 1.5 mm. (*ii*) The width of the vertical stroke should be .25 mm. (*iii*) The space within the letters should be .5 mm. (*iv*) The space between the letters should be .50 to .75 mm. (*v*) The space between the words should be 2 mm. (*vi*) The leading should be 2.5 mm.

2. The standards for children are as follows: —

A. First Grade. — (*i*) The height of the small letters should be at least 2.6 mm., with the other dimensions in proportion. (*ii*) The width of the vertical stroke should be from .4 m. to .5 mm. (*iii*) The space within the letters should be from .8 mm. to .9 mm. (*iv*) The space between the letters should be about 1 mm. (*v*) The space between the words should be about 3 mm. (*vi*) The leading should be from 4mm. to 4.5 mm.

B. For the second and third years the standard may be reduced slightly, but the letters should not be less than 2 mm. in height, and the leading should be 4 mm.

C. For the fourth year height and leading should not be less than 1.6 mm. and 3 mm., respectively. It would be better to retain the standard of the fourth year through the sixth year.

(3) *Reading in Relation to Posture.* — A proper posture with head erect is necessary to make reading hygienic, and suitable seats and desks are necessary. The same general rules apply as for posture in other subjects of instruction, but it is desirable that habits of correct posture be developed during the years of school life so that an hygienic posture may be used in home work as well as in the school. (See Desks; Writing.)

(4) *Reading in Relation to the Mental Habits Formed.* — As reading is supposed to be an essential accomplishment for culture and so large a part of school work is based upon reading, the mental habits formed in this scholastic occupation are of great importance. Habits of attention, of orderly association, of attention to the essential and of ignoring the unessential details, habits of suitable alternation of work and rest, are all significant. Reading becomes, in much of our life to-day and in case of many of our school children, distinctly a vice, and it is at least likely to be injurious if the reading habit is formed at too early an age. Mosso, President Hall, Professor Patrick, and others, maintain that a child should not learn to read before the age of eight; and while perhaps no harm will come from acquiring this accomplishment at an earlier age, the reading habit at least should be postponed until later. Not only should the child at this early age be engaged in spontaneous motor activities, play, simple forms of manual exercises, and the like; but on the other hand his organism is not adapted for the work of reading, especially as his eyes are likely to be undeveloped, his arms too short to hold the book at the proper distance from the eyes, and his respiration, circulation, and digestion likely to be interfered with by prolonged sedentary occupations, and the psychophysic mechanism in general is not fitted for such work. W. H. B.

See Eye, Hygiene of; Voice, Hygiene of; Desks and Seats, School.

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READING, PSYCHOLOGY OF. — In the widest sense of the word the interpretation of any optical or tactual symbols may be called reading. It began with the crude symbolic drawings of prehistoric man. In its narrower sense reading refers to the perception and interpretation of written or printed words. In this sense reading is both an end and a means in our common school education. It is an end in so far as the child must be taught to read. It is a means in so far as books are used as sources of information. The two aspects are not independent. Information may be given in the primers, while final efficiency in the assimilation of printed matter should be the criterion of satisfactory training.

The pedagogical and practical importance of reading combine with its purely scientific aspects to make the recent development of the psychology of reading unusually suggestive.

It is the more important carefully to distinguish between experimentally determined scientific facts and the easy generalizations which are so often developed under the influence of special needs and interests. Psychology of reading does not determine the best method of teaching reading, the proper time to begin, or the best sequence of reading matter. Its real aim, as yet only partially fulfilled, is to describe the facts. The scientific pedagogy of reading, on the other hand, is a normative science beginning where psychology leaves off. It is a separate body of knowledge with its own aims, methods, and results.

Obviously, all reading must involve three more or less distinct steps: (1) ocular adjustments to see the words; (2) the apprehension of the words as visual objects; and (3) the comprehension of their meaning. Reading aloud involves two additional processes: (4) the coördinated activity of the organs of speech, and (5) the perception of the resulting sounds. Scientific analysis goes farther. It seeks to describe these various processes in detail, to discover their causal interrelationships, and the part each plays in the total linguistic process.

Eye Movements and the Reading Pauses. — The eyes of a reader do not move evenly along the lines of print, but rather in a succession of jerks which are separated by full stops. The stops are moments of fixation and of clear vision. They are the essential reading pauses. The jerks are rapid eye movements. Their only function is to bring an appropriate part of the line or page to a retinal area of clear vision. Each line is thus read by sections. But each section is always seen in its peripheral setting. There is no sharp division line between the clear and the obscure.

Sometimes the peripheral vision of words, when they are indistinctly seen in the hazy part of a line, is sufficient for reading. It is always useful, furnishing an important premonition of coming words and phrases, as well as a consciousness of the relation of the immediately fixated symbols to the larger groups of phrase and sentence. Without this premonition of coming words and the outlines of larger groups, the process of reading would be slow and difficult.

The number of reading pauses in any line is determined primarily by the size of the sections that must be clearly seen. In rapid reading of familiar or easy text, the eye movements fall into a kind of habitual rhythm, making the number of reading pauses approximately constant from line to line. The extent of the reading sections varies according to a large variety of conditions, only some of which are understood. Unfamiliar and difficult matter, poor print, and attention to textual details, all have been shown to increase the number of pauses. Careful proofreading seems to demand a pause for every three or four letters. In inverse ratio to their development, children average more pauses than adults. In general, rapid readers average fewer pauses to the line than slow readers, their eye movements are more rhythmic, and the duration of the fixation pauses is shorter.

The " fixation point " usually remains well within the printed area. It neither goes to the end of a line nor starts at the beginning. Regular movement of the eyes along each line from left to right and back again to the next line is an acquired habit and has to be learned. It is disturbed by gross variation in the length of lines. Long lines complicate the adjustments with adaptations for distance. They make it difficult both to keep the place and to find the next line. The exact location of the fixation point within any given reading section seems to be a matter of relative indifference. In ordinary reading we do not look at a point or even at a single letter. Photographic records and after-image experiments both indicate that the fixation point may fall anywhere within words or even between them. The statement that it regularly travels along the tops of the letters is false. In successive fixations of the same phrase or word it never falls twice on the same spot, except by accident. Short words without especially striking form or habitual grouping encourage numerous fixations. Familiar and frequently repeated phrases, on the other hand, may be read entire from a single fixation. In binocular reading the eye movements are regularly complicated by variations of convergence. Their only importance for the reading process is the consequent fatigue.

The Visual Apprehension of Words. — The facts of eye movement indicate that we do not ordinarily read by a successive apprehension of the individual letters, however rapid or abbreviated. This has abundant experimental proof. Successive apprehension of the individual letters may occur, but it disturbs the ordinary reading process. Reading from a succession of letters is a slow and difficult process, depending on a mental reconstruction of the word forms in which they belong. This may be roughly demonstrated by moving a piece of cardboard, in which one has cut a small vertical slit, across a line of print. If the slit shows only one letter at a time, reading will be many times slower than normal, and relatively inaccurate.

The entire visual field which is given at any fixation pause really constitutes a simultaneous visual whole. Both in ordinary experience and in reading, we analyze this simultaneously given visual field into smaller units only so far as our practical needs dictate. In reading, our real interests are meanings, and they attach themselves to words and phrases, not to the individual letters. In case of special interests, like proofreading, we may analyze a word or even a letter, but that is not the way we read. The only succession of visual facts is the succession of different parts of the visual whole in the field of clear vision. Even the child, painfully spelling out a word letter by letter, sees each letter in its word setting. Without the visual word form, the continuous after effects of the past letters, and the premonition of the new ones, his succession of letters would never be a word. In adult reading the analysis of the visual field is less detailed. The area of effective premonition is larger.

The area which can be seen clearly during any one fixation may be measured. If one holds his eyes relatively still, only about five letters of print will be unequivocally clear at one time. Not more than three are sharply defined. If a group of letters is suddenly exposed with a shutter for .1″, from four to six letters only can be apprehended from one exposure. For regularly grasping six letters one needs special practice and favorable conditions. Under these same experimental conditions, words of twenty odd letters may be read with comparative ease. It is even possible to read still more letters in familiar phrases and significant word combinations.

A peculiarity of these experiments is the persistent illusion, when words and phrases are read, that they are seen clearly throughout. This would be physiologically impossible. The illusion indicates, what is otherwise thoroughly demonstrated, that central factors combine with the objective stimuli in the apperception of familiar words and letter groups.

Every group of letters has a more or less characteristic group form. It varies with the letters that compose the group, but letters in groups develop at least two new characteristics. Optically speaking, the form of bounded spaces is a function of the combination of their boundary lines, while masses may affect us when their composite parts remain unnoticed. The configuration of the white background and the massing of black both vary with every change of letter combination. The plateaus, hills, valleys, and gorges of black are often quite characteristic, and familiar words can be read from these characteristics when the individual letters are too indistinct to be made out.

The relative participation of the word form and the individual letters in the recognition of words is one of the most contested points in the psychology of reading. Unfortunately, it has important pedagogical bearings.

The psychological truth that we regularly read in word wholes and phrase wholes has been freely exploited in recent pedagogy. The coöperation of the area of clear vision has been generally ignored. In tachistoscopic experiments with adequate exposure there is no evidence that either the total word form or the cleared area predominates in the visual perception. Possibly their relative importance varies; some of the errors seem to indicate it. Certainly that part of the visual field to which one directly attends may vary. It may correspond with the area of clear vision, but it may be peripheral. It may be a point, or it may be an entire page. It is possible that there are perceptual types. In normal reading, however, there is abundant evidence that the word forms, indistinctly seen in peripheral vision, begin the reading process well in advance of direct fixation and the consequent clearing up of the letters.

It is this premonition of coming words and phrases, sentence breaks, and paragraphs, that determines the position of future fixations, and reduces the duration of individual fixations sometimes to pauses one quarter the normal perception time. They are often less than the simple reaction time of the eye.

In addition to visual premonitions, meaning premonitions regularly contribute to the apprehension of the fixated word. This is obvious in familiar paragraphs where the fixation pauses are consequently few. But one can stop anywhere in a sentence of new matter and make a good guess at the next word. Sometimes we substitute synonymous words in reading aloud, without knowing it. Or, having a false premonition of the sense, we may misread. Adequate premonitions are as conspicuously lacking in the stumbling reading of childhood as in our reading of a foreign language. Their development is a most important part of the training in rapid reading. The very rapid reader who makes two or three steps in a line can see no more distinctly than the plodder with ten. His main advantage is in the way he grasps what he sees only indistinctly in the extra-fixational vision.

In adult reading the moment of actual fixation seems to be an incident somewhere in the middle of the reading process. Coming between the premonition and the after-echo, its effect is to correct, to confirm, and to intensify the premonition. Psychologically its function is selective and definitive. It emphasizes the excitation of suitable residua and inhibits the misfits. The pedagogical importance of the word forms is clear. It is possible that special training in peripheral vision would be worth while. But it is equally evident that no training is adequate which does not provide for the corrective coöperation of direct fixation.

Comprehension of the meaning is the immediate goal of all reading. But comprehension is a special process. It follows from the other reading processes only when its especial conditions are fulfilled.

The relation between thought and words is only incidentally a problem of reading. It belongs to the general psychology of language. Words are parts of our total experience that come to stand for the rest. We understand words when the experience of which they formed a part is revived in consciousness. For the adult this revival is usually fleeting and partial, without distinct mental imagery. In early childhood meanings are apt to be specific experiences which are revived with vivid mental imagery. This typical difference is important in the selection of reading matter. The child's needs are concrete.

The acquisition of new information from reading depends on the experiences already connected with the words, and the processes of analogy by which new imaginary experiences are constructed out of the materials of the past. Unfortunately, the symbolic value of the printed word is relatively poor. It lacks tone, accent, emphasis, and gesture. Pictures may help, but ultimately the child must learn to make his mental construction without them. The child's play of vivid imagery tends to outrun the plodding apprehension of the words. Handicapped by inadequate experience and without adequate premonition of what is coming in the text, the accurate comprehension of meaning is for the child a complex and often a tedious process of mental readjustments.

Articulation. — In the development of language, graphic symbols for words are a relatively late acquisition. A large part of humanity does not possess them at all. They are regularly learned by children after the fundamental associations between vocal utterance and ideas are well established. Words are thus associated with meanings largely through their motor-acoustic aspects. Our written and printed words are well adapted for this relationship, since they represent not only words as a whole but the individual sounds in the order of their vocalization. This symbolization is not exact and probably never can be. In view of the movement to minimize its inadequacies, it is well to remember that familiar word forms are more serviceable in rapid reading than accurate symbolization of the sequence of sounds. The latter is important chiefly during the learning process. It is not impossible that the future development of printing may be towards the greater individualization of words even at the cost of phonetic abbreviation.

The indirect association of words with their meanings through their motor-acoustic residua is persistent and almost universal. Clinical observations of aphasia indicate that it has a definite anatomical basis. It may be necessary. Certainly its effect on the reading process is far-reaching. It seems to be impossible for most adults to read without saying the words to themselves. Some persons regularly move the speech organs or mumble the words. In the child, vocalization insures the adequate apprehension of each word. In rapid reading the motor-acoustic images are more or less abbreviated. It is one of the problems of the pedagogy of reading to determine how far this abbreviation may go. Certainly adequate training demands the suppression of actual movements.

The relation between the simultaneous wholes of vision and the successive wholes of articulation is the probable basis of the illusion of successive visual apprehension of a word. In reading aloud the eyes regularly keep somewhat ahead of the actual speech. In rapid silent reading direct fixation and the motor-acoustic images are more nearly simultaneous. Apparently the visual premonitions start the motor-acoustic processes. Comprehension reaches well ahead and back into the past uniting all the fragments into a consistent whole.

In view of the complexity of the adjustments and coördinations that are involved in reading, their dependence on individual experience, and their probable typical variations, it is evident why the teaching of reading has not evolved into a simple mechanical process.

Methodological simplicity must miss something of the real complications. The total process is neither all analysis nor all synthesis. Every moment of reading involves both in ever changing combinations.

Two main problems confront the pedagogy of reading: (1) the problem of developing the necessary interrelated habits in different individuals, in the least time, with the least useless friction, and the most residual benefit; (2) the problem of raising the general level of reading efficiency. R. D.

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READING SCHOOLS. — See ABCdarians; Dame Schools; Colonial Period in American Education; Writing Schools.

READING, TEACHING BEGINNERS. — The purpose of teaching children to read is to give them the power to acquire thought from the printed or written page. In actual school practice the dominant aim may go beyond thought getting to expression, when oral rendition becomes the chief purpose of instruction. This is often the case in the intermediate and grammar grades. It may fall short of thoughtful reading in the primary grades, where the mechanics of pronunciation and spelling obtrude themselves as a difficulty from the very beginning, and gain disproportionate attention from both teacher and child at every step. Ready silent reading which gives the pupil mastery of meaning should be made the primary end; oral reading, whether for mastery of the mechanics of pronunciation or for fostering skill in expression, is a secondary consideration. The phonetic interpretation of printed words is merely an accessory in getting thought, and no technical training in vocal intonation can be successful unless the meaning to be expressed is thoroughly grasped. That these relations between fundamental aims and accessory skills have not been maintained in actual schoolroom procedure is apparent to the most casual student of contemporary teaching. The fixed traditions of the profession have been against such a view. The most active battle ground in the reform of school teaching is found in the primary grades, particularly in the first school year where beginners are taught to read. The mistakes committed there have persisted through the grades, and the reconstructions successfully established there have quickly influenced higher teaching. A discussion of the problem of teaching beginners to read is, therefore, crucial.

Effective reading depends upon the association of three factors: (1) The meaning which the word or words symbolize, (2) the visual form of the word, and (3) the pronunciation of it. (See Fig. 1.) *M* = meaning; *V* = visual or printed form of word; *O* = oral form or pronunciation.

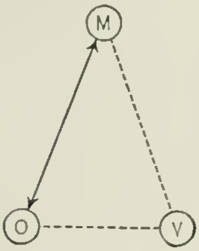

Fig. 1.

The child who enters school for the first time is not ignorant of all these factors. He has had a considerable number of experiences (*M*) with which he has already associated the appropriate words, phrases, and sentences of speech (*O*). He lacks only a knowledge of the third factor, the printed forms (*V*), which are to be associated with experience and speech. In consequence the school's first effort has been to supply the missing association between the printed form and the pronunciation (Fig. 1). If the words on the page were within the spoken vocabulary of the child, their meanings would be recognized if the child could be given the power to convert what he sees into sound (Fig. 2). In consequence the schools of the last century have largely aimed to teach children to render printed words into sound (the mechanics of reading) on the faith that an already existing association between pronunciation and meaning would complete the pathway to meaning. In the natural course of events, it was assumed, the association would become a direct one between print and meaning (Fig. 3). The effort to solve the problem by this approach through sound has led to the development of a long series of so-called *phonic methods.*

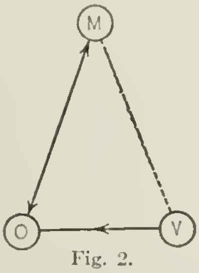

Fig. 2.

The earliest of these phonic methods was the *alphabetic method.* The children learned the alphabet so they could readily identify any letter by its name. Then the child would, in a very rough way, convert the familiar word (cat) into its alphabetic name units, obtaining a very rough suggestion of the sound of the word (see-ay-tee). Such reading by spelling was further assisted by syllabic drills (ay-bee ab; bee-ay ba; etc.).

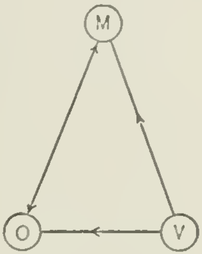

Fig. 3.

The crudity of such alphabetic spelling was apparent, and a more refined method of phonic spelling soon came into vogue. In this method the letters of a word are spelled by their elementary sounds, not by their alphabetic names. Then the elementary sounds associated with the letters are blended into a pronunciation of the word. But silent letters, single letters with more than one sound, and several letters grouped to represent a single sound interfered with the efficiency of the *phonic method.* By a very careful selection of words such difficulties could be avoided, but not for long. In consequence this simple phonic method gave way to more complicated *phonetic methods.* An attempt was made to give each sound its own characteristic symbol. This was done in two ways: (1) Additional characters were contrived so that forty-four or more characters are used instead of twenty-six (*e.g.* the characters for the various sounds were kept similar in general appearance, but differentiated in detail for each sound value). Silent letters were printed in hair lines. (2) The usual twenty-six letter characters were preserved and the differentiations were made by placing a diacritical mark above or below the regular symbol. The second method does not attempt to reconstruct printing so much as to provide a more accurate identification during the learning period. Psychologically, however, the *diacritical method* provides as many phonetic characters as the *extended alphabet method.* In either case the child has finally to learn to pronounce words without these special and artificial aids, which involve two forms for a single pronunciation, and increase the child's task of memorization.

A reaction against reading words as they are not presented in books was inevitable. Here and there the reformers, still believing in a phonic method, attempted to teach children to read in a less artificial way. Some went back to the syllable as a basis, thus increasing the unit of attack and avoiding some of the difficulties of alphabetic and phonetic spelling of words. But the syllable is an in-flexible unit which does not with sufficient frequency correspond to the child's natural way of analyzing or building words (num-ber *versus* n-um-b-er; nudge *versus* n-udge, etc.). The search for a larger, more flexible, and less artificial method culminated in the use of the phonogram or natural sound unit: (l-ight, g-ood; m-an-li-ness), and the *phonogrammic method* quickly supplanted the *syllabic method*.

Many advantages are claimed for the phonogrammic method: (1) It separates words purely on the basis of their sound division, avoiding the units of the syllabic method which are determined by philological derivation or conventional practice. (2) It is more flexible, as it can take into account the maturity and individuality of children (h-um-ble-n-ess, humble-ness, etc.). (3) It tends on the whole to induce the child to see the word elements in the largest possible units of identification, making sound approximation more accurate and sound blending more easy. (4) It treats irregular words (the chief bugbear of phonetic methods) as a phonogrammic unit or sight word (through). Though not inherent in the method itself, teachers who use the phonogrammic method find it less necessary to depend on diacritic marks, accents, printed word divisions, and all other artificial devices that give words a different appearance from that which they have in normal use.

It is to be noted that the evolution of phonic methods shows several important tendencies which in themselves are indicative of the fallacies which underlie the work of those who have stressed the method of word-sound translation as the chief means of teaching reading to beginners. They are as follows: (1) These methods are chiefly synthetic at the start, but tend to become an analytic-synthetic method. First, the child is given the alphabet and its names; and then builds the word sound from the units. Later with the phonogram he breaks the word up into familiar sight units that are natural to him and then blends them into a pronunciation of the word. (2) The unit for handling sounds grows larger: letter, syllable, phonogram, sight word. (3) There is a decreasing artificiality in the teaching devices employed; note the abolition of diacritics, marks, etc. (4) The use of larger units and more natural methods frees the child's attention from mere phonetic translation and permits it to focus in larger degree on the meanings he is trying to obtain from his reading.

But there is a fundamental fallacy underlying the premise which has led to this large dependence on phonic methods in teaching beginners to read. It has been assumed that children would gain meanings from their reading if they could translate the printed words into correct pronunciations (Figs. 2, 3). This seems a reasonable assumption when the words used in reading are within the experience and oral vocabulary of children. But even when this is the case, children, so much engrossed with the mere mechanical translation of symbols into sounds, hardly let their normal associations enter into their thought; they become mere pronouncers, the "parrot-readers" known to every school system. But the reading material more and more tends to be outside the vocabulary and experience of first-grade children, for three reasons: (1) Our American school population is less homogeneous than it once was. The experiences and consequently the vocabularies of young children vary greatly with economic and cultural station and geographical location. The modern primer is not effective in giving a vocabulary common to urban and rural pupils, the children of the rich and the poor. (2) The problem is still further complicated by the large number of school children who are foreign born or American born of foreign parents. These do not have a command of oral English, and getting the sound of words does not lead to their meanings. The large number of foreign children who have recently entered our country and our schools has been the largest single factor in revealing the futility of methods of teaching reading in the American receiving classes. (3) Finally, that pedagogical movement which has fostered the reading of children's classics in the lower grades, instead of presenting matter thoroughly familiar to the child, has introduced a host of new words outside their life and speech. Under these conditions the traditional phonic methods, in spite of their improvement, have become less and less adequate; and other methods designed to focus attention on the direct connection between printed word and meaning have grown in favor.

These so-called *thought methods* have always been used. In a sense they are our oldest methods. But in conscious pedagogical theory they are more recent than the phonic methods already discussed. There are three types of thought methods: (1) the *sentence method*, (2) the *phrase method*, and (3) the *word method*. The *sentence method* assumes that the sentence-whole is the real unit of thought, speech, and pronunciation. Often the sentences are the product of the child's own experience and speech, and are written down on the blackboard as they are spoken in description of a picture, object, or action, or in narration of a story. The child reads these sentences naturally, as they express a reality. Sentences with similar beginnings and different endings (or vice versa) are placed in a row and read. Specific phrases or words thus come to be associated with their own form, their particular pronunciation, and their meaning. Words are similarly treated in the derivation of word parts. The *phrase method* is less often mentioned, as the thought method of teaching reading has been discussed chiefly in terms of the sentence and the word method. It has been a stage in supplementation of the sentence method when identification of parts of sentences or words was desired before proceeding to phonic analysis. It has been necessary as a supplement to the word method, inasmuch as the meaning of certain parts of speech (prepositions, conjunctions, etc.) is not easily obtained save in context (" to the door," etc.). The *word method*, which is probably older than the sentence method in our conscious theory, appeared as a conspicuous protest against the tedious and mechanical phonetic methods of traditional practice. Here the total visual form of the word is associated with its whole sound, the assumption being that it is about as easy to learn a word unit as a letter unit. This view holds that the pronunciation of a word is not a sum of its letter sounds, but has its own character as a unit. So the word method is held to be more economical and natural as a mode of teaching. All these assumptions are borne out by the conclusions of experimental psychology. Teaching children to read by words is undoubtedly the chief simple method utilized by progressive teachers, though almost always supplemented by others. Some phonic work is almost always associated with it to give the pupil power to pronounce unfamiliar words by himself.

The word method, like all of the phonic methods, usually tries to bridge the gap between print and meaning through the mastery of the pronunciation, usually given by the teacher in association with the visual form. But like all the other thought methods it is less likely to ignore meanings. The word method has been used in getting direct association between things and their visual symbols, with the oral symbols somewhat subordinated. The association of printed names with pictures on blocks and in books is a characteristic example of the emphasis. The labeling of every possible thing and situation in a child's nursery is an attempt to employ the same means.

The word method alone does not give the child power to read. The words must be recognized as they are grouped in sentences. In consequence the word method is seldom used in isolation from the sentence any more than it is from phonic elements. In established procedure it has been one of the least artificial and most stable of special methods.

As the phonic methods have been chiefly synthetic in procedure, starting from parts and proceeding to large word units, the *thought methods* have been characteristically analytic. In recent years the method of progressive teachers has been a complex blend, both analytic and synthetic. Familiar sentences are made basic, then phrases are isolated, then words, phonograms, and consonants. Then with some preliminary work in word building or blending of new words, the children's power of identifying the sound of words has been extended by practice to the recognition of new words, phrases, and sentences made up of familiar units. The complete analytic-synthetic process is not prolonged over weeks, but occurs within a single lesson unit, the first and last exercises of the children being with large combinations expressing real thought. Naturalness everywhere characterizes its procedure. The children's old experiences are used whenever possible, and a multiplicity of artificial devices is done away with. The method of deriving sounds is a good example of increasing naturalness and economy in method. For example, the sound *r*, which in the *Johnny Story* of an older synthetic-phonetic system was derived by imitation of a dog's growl, is now merely the first sound of the well-known word " rat," which is pronounced more and more slowly until the sound and the symbol of *r* are isolated, or the common initial element in a list of familiar words beginning with *r* (rat, run, race, rag, etc.) which is emphasized through repetition of itself and variation of its phonogrammic affixes. Again, the diacritical marks are almost crowded out of use by the phonogram. Those memorized are chiefly the long vowel sounds. More are not needed for dictionary reference because children are taught to get the sound by analogy from the familiar key words at the bottom of the dictionary page.

Inevitably the sentence and word methods have given a greater emphasis to real reading for thought. Modern tendency has not been content with that improvement alone. The reading period has ceased to be formal and has become enriched with interesting content. The better teachers have not been willing to take much for granted in the way of experience and oral vocabulary. At any rate, they have tested to see that the necessary basis in experience and vocabulary is present. They have preceded the reading of the text with story telling, conversational lessons, picture writing, and action work. If the children did not seem to have the basis, it was at once provided through objects, pictures, games, dramatization, etc. Then oral reading was successful.

The meaningless subject matter of the primers, devised chiefly for formal drill in phonics and neglecting all appeal to the children's interests, is largely disappearing. The interesting episodes of child life replace them. Children's classics enter — the jingles and rhymes of Mother Goose, the fairy tale, the myth, the animal story, easily memorized songs and poems. The formal reading texts are supplemented by other reading books so that there is no lack of interesting material to give vitality and motive to the children's reading. If there must be formal exercises, they are a subordinated activity paralleling the reading for thought, which is the central and chief occupation of the pupils. Oral reading is a little less conspicuous in the first grade than it was. Quick silent reading with the whole effort centered upon getting ideas has displaced it somewhat. At first the children tell what they have learned, in their own words or by acting it out. Later, they read the thought to others, more expressively than children used to do because they have better things to read. They have more motive for studying their lessons and reading aloud to their fellow pupils, for reading lessons are more often assigned to groups instead of to the whole class as before. The "letter-by-letter" stuttering or the halting "word-by-word" pronunciation is avoided by emphasizing thought rather than form. A natural speed and phrasing is obtained because present methods favor these habits from the beginning. As an additional safeguard, concert reading has been abandoned.

There are other problems in teaching beginners to read, but most of them are less important in current discussion than those already mentioned. Some prefer to begin reading from script, later passing to print. Others prefer an exclusive use of print from the beginning so as to lessen the number of forms which the child must master, thus decreasing attention to formal work. There are teachers who prefer no beginning text, no basal readers with a systematic treatment of phonetic difficulties. These insist that all that children read at first should be associated with their own lives, so that reading is merely appreciating in visual form what children comprehend and use in speech. Only later, when phonetic difficulties are fairly well mastered, should new experiences come through the printed symbol. Still others stress quiet, silent reading, making it the goal of all their efforts. The relative amount of prepared and sight work is another ground for controversy. The solution of all these minor problems hinges on the larger questions already suggested and treated. H. S.

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READING UNIVERSITY COLLEGE, READING, ENGLAND. — An institution founded to promote "general, civic, and technical education and research." In 1860 art classes were established in connection with the Science and Art Department; in 1870 University Extension lectures were introduced by the Oxford Delegacy. In 1892, on the initiative of the governing body of Christ Church College, Oxford, the College was established as the University Extension College in conjunction with the Schools of Science and Art, Reading, the latter part of the title being dropped in 1893. Literary and agricultural departments were organized, the latter being connected with the British Dairy Farmers' Association, in 1895. In 1902 the institution became a University College entitled to grants from the Treasury. A horticultural department was opened in the same year. Experimental work in agriculture was added in 1903, and in 1906 new buildings were provided, largely by public subscriptions, and additions were made in 1909. The administration of the College is in the hands of a Court of Governors, a Council, and an Academic Board. The income of the College consists of fees, endowments, and grants from local authorities, the Treasury and the Boards of Education and of Agriculture. The College has not the power to grant degrees but prepares students in day and evening courses for the examinations of the University of London (*q.v.*). It may, however, grant the Diploma of Associate in the various faculties (letters and science), and departments (agriculture and horticulture; fine arts; music; commerce and technical subjects). A department for the training of elementary and secondary teachers is maintained, and recognized by the Board of Education, which gives annual grants for the work. The enrollment of students in 1910 in day and evening courses was 1124, with a faculty of sixty-five members.

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REAL PROBLEMS. — See Problems.

REALGYMNASIUM. — Schools in Germany offering in a nine-year course in science, mathematics, drawing, two modern languages, and Latin. This type of school arose at the beginning of the last century as a concession to the opponents of the purely modern schools by the addition of Latin to the curriculum, as Hecker had already done. The school, which served as a model for others, was the *Köllnische Realgymnasium*, opened in Berlin in 1824. Many of these schools gradually became, under pressure, pure gymnasiums. The rapid technical and commercial development, however, led to the recognition in 1859 of the importance of modern schools, and the *Realgymnasiums* were included in the *Realschulen Erster Ordnung*. After 1882 these schools tended to be crowded out between the *Oberrealschule* and the *Gymnasium*. Since 1900 the *Realgymnasium* is on an equal footing with the *gymnasium* as regards the privileges obtained by graduation.

See Germany, Education in.

REALISM (PHILOSOPHICAL).—See Idea, Idealism and Ideation; Idealism and Realism in Education; also Concept and Conception; Scholasticism.

REALISM IN EDUCATION. — See Idealism and Realism in Education.

REALISTIC TENDENCY IN EDUCATION. — The term usually given to the tendency in educational thought and practice to center all instruction around things rather than ideas. This movement had its inception in the seventeenth century and centered on its philosophical side in the writings of Bacon and on its practical side in the work and writings of Comenius. The philosophic aspect is discussed under the caption IDEALISM AND REALISM IN EDUCATION and under BACON; the practical aspect under COMENIUS, FRANCKE, RATKE, HARTLIB, and other leaders in the movement, and under OBJECT TEACHING, OBJECTIVE METHOD. The institutional aspect of the movement is also discussed under ACADEMIES, *Real* SCHOOLS, and the various sciences in the schools.

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REALSCHULE (REAL SCHOOL). — The name by which the secondary schools of Germany, which offer a six-year course in modern subjects, are known. In the historical development of the schools which give a nonclassical education may be traced the influence of many prominent educational leaders, *e.g.* COMENIUS; RATKE; FRANCKE; SEMLER; HECKER; BASEDOW, and many others; and of several distinct movements, *e.g.* PIETISM; PHILANTHROPINISM; ENLIGHTENMENT; SCIENTIFIC TENDENCY. The *Realschule* of Prussia may be traced back directly to the schools established by Semler at Halle (1706) and by Hecker in Berlin (1847; now the Friedrich-Wilhelms *Realschule*). Such schools were intended for those who had ability, but not as "students" (*i.e.* of the traditional studies), and wished to receive preparation for other than the learned professions. Many schools were established in imitation of Hecker's and continued in their development until the New Humanistic movement gave them a setback. (See NEOHUMANISM.) Further, in order to secure admission to the *Reifeprüfung* and the state service many *Real* Schools added Latin to their curriculum. In spite of much opposition in the two preceding decades, the Real Schools were definitely organized in 1859, through the influence of L. Wiese, as schools for general culture rather than as vocational schools. They were divided into two classes: (1) *Realschulen Erster Ordnung, i.e.* schools which offered six and nine year courses, including Latin, and had the privilege of one year military service, and (2) *Realschule Zweiter Ordnung, i.e.* schools offering a six-year course without Latin and having their own leaving examinations without any privileges. In 1882 the nine-year *Real* Schools offering Latin were recognized as *Realgymnasien.* As a result of the December Conference of 1890 the *Oberrealschule,* with a nine-year course, and the *Realschule* were recognized as definite parts of the secondary school system. Since 1900 all the nine-year schools, including the *Oberrealschule,* were put on the same footing, so far as privileges are concerned, with the *Gymnasium* and *Realgymnasium,* with the exception that admission to certain professions depends on presenting additional examinations in Latin. The *Realschule* now gives a six-year modern course and graduates are given the privileges of the one year military service and entrance to certain branches of the public service.

See GERMANY, EDUCATION IN.

REASON. — See THOUGHT; also JUDGMENT.

REBUS PUZZLE. — See PUZZLES.

RECALL. — See MEMORY.

RECAPITULATION. — The fourth step or stage in the five formal steps of the recitation formulated by the followers of Herbart. The stage of generalization or system. H. S.

See RECITATION, METHOD OF; STEPS, FIVE FORMAL; APPERCEPTION. See also CULTURE EPOCHS.

RECEPTORS. — See NERVOUS SYSTEM.

RECESS. — See PERIOD OF STUDY; SCHOOL MANAGEMENT; SESSION, LENGTH OF.

RECITATION, METHOD OF. — The term recitation is used with various meanings in educational discussion. Originally descriptive of the dominant type of exercise employed in classroom instruction, it came to attach itself to the time period allotted for instruction in a given subject. Thus, the daily lesson of twenty minutes assigned by the administrative time schedule to geography came to be called the "geography recitation" by both teachers and children. Any exercise allotted to a special subject, therefore, was called a recitation, making the term coincident with lesson or lesson period. When the uniformities of teaching methods employed in all lesson periods became a matter of definite theoretic discussion, these general methods of procedure were discussed as "the method of the recitation." The wide and dominant influence of McMurry's *Method of the Recitation* (1897) as a pedagogical text tended to fix an already existing tendency. In recent years many influences have been responsible for broadening the scope of *general method* and giving the term *recitation* a more restricted meaning. Among these are: (1) the addition of new school studies unlike the traditional subjects in content and purpose; (2) the increased number of pedagogical procedures developed under the influence of educational psychology; and (3) the growing appreciation of extra-schoolroom activities as vital educative processes. The introduction of art, nature study, household arts, manual training, etc., has developed types of teaching exercises not obviously necessary in the traditional subjects. These have attained a status in the newer fields, and their use has been extended to the older studies. The new psychological insight which has been so active in recent pedagogy has still further enriched our stock of educative methods. And finally, plays, dramatization, sociability, self-government, and other extra-classroom activities have given a still wider conception of the educative process. The result of such a widened view of the school's processes has been to give general method a meaning far more broad than that of a "method of the recitation," whether the phrase be taken to indicate a particular type of teaching or the group of methods generally characteristic of teaching in a class period. To discuss general method as "the method of the recitation" seems more inappropriate when one thinks of shopwork and field excursions. Recitation is apparently not a general method when a dozen other types of teaching are every day employed alongside of it, and finally it must seem, more than ever before, an inadequately descriptive term when educative activities other than those in the classroom come within the scope of our conscious pedagogical theory. Such broader titles as "educative process," "teaching process," "general method," "principles of education," "principles of teaching," etc., perform the wider function of the older "method of the recitation"; and "recitation" acquires a narrower meaning as merety one type of exercise in teaching.

There is still a general method of the recitation or lesson period which requires analysis and statement. All lessons have common characteristics, in so far as all classroom teaching is different from other educative activities of the school in being more deliberate and formal. Again the necessity of teaching within an arbitrary time limit imposes certain modifications upon the teaching process. The compulsion to begin a subject anew and to close it at a given time gives a similar mode of beginning and ending to all teaching conducted within a single "recitation" or class period. There is need of a preparatory step or introductory review to pick up the threads of the situation studied the preceding day before the teacher can go on with his presentation. To leave knowledge well organized for an interruption, an application, a summary, or a review is necessary at the end, and if the children are to pursue the study further the teacher must allow adequate time for a clear and well-motivated assignment of work. Whatever activities are undertaken between beginning and closing are themselves subject to limitations which the teacher must take into account. The subject under study must be resolved into a topic or problem capable of effective treatment. This need was first met in lesson plans by making the lesson period the unit of treatment. Now that larger method-wholes (determined by the nature of subject matter and the teacher's purpose rather than administrative system) are utilized, the teacher makes the detailed readjustments required from day to day, keeping in mind the general characteristics of formal teaching and the limitations of the time unit.

Assuming that all formal classroom instruction has the common characteristic of aiming at the development of logical notions (general notions or concepts derived from particular notions) and modifying this purpose by acceptance of the limitations imposed by the recitation or lesson period, a distinctive general method of the recitation, with formal steps or stages, has been evolved by educational theorists, more particularly by the followers of Herbart. This "inductive development" method of the recitation (as it is called by more recent writers) was originally suggested by Herbart and then variously modified. The lesson unit, as analyzed by Herbart, comprises four steps: (1) clearness (in grouping details), (2) association (of common qualities or relations), (3) system (in forming and relating judgments), and (4) method (in applying judgments to practice). The first of these steps was subdivided by subsequent writers so that "five formal steps" are usually given by contemporary American and English writers. Renamed, these are: (1) preparation (of the pupil's mind), (2) presentation (of new knowledge), (3) comparison and abstraction, (4) generalization, and (5) application. There is a recent tendency toward still further modification where "statement of the aim" (to give a unifying and motivating problem) is prefixed as a first step, and "assignment" (of the problem and method for further study) is added as a seventh. But in presenting this definite teaching method for dealing with a "lesson unit," it was incorrectly assumed that development of general notions and practice in their application are universally characteristic of all classroom instruction. Liberally construed, such a "method of the recitation" has a wide application in the acquisition of knowledge where generalizations, principles, definitions, and rules are concerned. But the particular facts upon which these rest often call for extended observations and demonstrations wherein these "steps" can scarcely be utilized. Again, it is frequently unnecessary, inexpedient, and even dangerous to teach all general notions by any such series of formal stages. Children can often with economy be told truths; the requisite data may not be at hand; and certain moral truths do not, with safety, lend themselves to an inductive treatment in the manner suggested. Where the teacher is aiming at the development of skill in expression or taste in feeling, this method is not even remotely applicable.

Because of the limited range of the activity within which the traditional Herbartian method of the recitation applies, a broader, more versatile, and less rigidly formal method of treating the lesson unit is coming into acceptance. It is as yet a tendency without clear formulation. In this newer view, all teaching is planned (regardless of the lesson period) on the basis of method-wholes, *i.e.* a unit of procedure where a single central thought, problem, or topic dominates the entire movement. This large movement in teaching is made up of many lesser movements, which succeed each other as the nature of the problem, the child's psychological need, and the teacher's immediate purpose dictate. Each of these lesser movements has a form which is typical; hence the phrase "types of teaching." Typical modes of teaching are not steps or stages, exclusive of each other, but teaching movements overlapping each other, yet differentiated on the basis of emphasis in form and function. Among such types of teaching are drill, development, study, practice, experiment, objectification, assignment, review, recitation, examination, etc. A single lesson unit is made up of a combination of these, as a method-whole is made up of lesson units. Such a conception of teaching implies: (1) that each type of teaching is a specialized form with a particular function having limitations as well as a given superiority, (2) that each type has a limited applicability and therefore requires other types to supplement it in an effective and wholesome treatment; and (3) that the order in which these occur and the frequency with which each recurs is determined by the aims and conditions involved in the teaching process. This newer conception of the "method of the recitation" is less simple, but more accurate. It commends itself in offering a natural, flexible, and widely applicable substitute for the formal, rigid, and restricted conceptions previously accepted. H. S.

See Teaching, Principles of; Teaching, Types of; Steps, Five Formal; Supervision of Teaching.

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RECITATION PERIOD. — See School Management.

RECOGNITION. — That phase of a memory process in which the present experience is definitely related to some former experience. Thus, one recognizes a person whom he now sees as identical with the person whom he saw yesterday. (See Memory.)

The term is also employed in a somewhat more general way to indicate any completed form of perception. Thus, one is said to recognize the object before him as a book. As pointed out under the term "perception," every process of this type involves certain memory elements. The book is recognized because elements of past experience are united with the present sensory qualities in a complex mental act. C. H. J.

RECOLLECTION. — That phase of the memory process in which a past experience is reinstated; thus the process of recollection appears in the bringing into consciousness of the visual image of the face or of the name which was experienced in the past. Recollection thus precedes in the memory process the stage which was described under recognition (*q.v.*). C. H. J.

RECORDE, ROBERT (1510?–1558). — English mathematician born at Tenby. After studying at Oxford, proceeding to the M. A., and being elected fellow of All Souls' in 1531, he went to Cambridge, where he read mathematics and medicine, obtaining the degree of M. D. in 1545. He returned for a brief period to Oxford, which he soon left for London, where he practiced medicine and became royal physician to Edward VI and Queen Mary. He also held several official positions, but seems to have died in poverty. Recorde was the earliest of the important English writers on mathematics. His earliest work was the *Ground of Artes* (1540–1542?), an arithmetic which went through many editions till the end of the seventeenth century. The *Ground of Artes* is in the form of a dialogue between master and scholar. Recorde indicates that "if number be lacking, it maketh men dumb, so that to most questions, they must answer Mum." In 1557 Recorde published the *Whetstone of Witte or the second Part of Arithmetic* (a play through the Latin title, *cos ingenii* on algebra as the cossic art, *cosa* being a thing, or the unknown quantity). This work is a treatise on algebra and was probably the best known of Recorde's works. It is mentioned in Scott's *Fortunes of Nigel* as the only book in a house besides the Bible. In this, for the sign of equality Recorde chose the symbol of two parallel straight lines, because "noe 2 thynges can be more equalle." Other works by Recorde are the *Pathway to Knowledge or the first Principles of Geometry*, etc. (1551), dealing also with astronomy and astronomical instruments. Recorde was probably the earliest Englishman to accept the Copernican theory, without, however, surrendering his belief in astrology. He also wrote several other works on astronomy and astrology, *e.g.* the *Castle of Knowledge*, a *Treatise on Astronomy and the Sphere* (1551).

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RECORDS AND REPORTS. — The development of adequate school records and significant school reports may be traced on the one hand to the growth of the profession of education, and on the other to the demand which the public is now making for complete information concerning public enterprises. There was a time when it was customary for school boards or school committees to make a report consisting largely of a statement of their activities in hiring teachers, in building and equipping school plants, and in visiting the schools. To-day teachers are hired and schools are organized and administered by an educational expert, and in like manner school reports are an account of the results secured under the direction of the school's chief executive officer. When school boards told of their activities, the schools were relatively few and the organization simple. The reports which they rendered demanded little in the way of expert knowledge either of schools or of refined methods of recording or reporting school activities. To-day there are many people who judge of the efficiency of a school superintendent in terms of his ability to satisfy any inquiry which may be made concerning the course of study, the teachers, the pupils, or fiscal aspects of the problem with which he deals, together with any interrelation which may exist among these several parts of the whole problem.

It is not easy to distinguish between records and reports. The records which are accumulated in any one field furnish the raw material of the report which is made concerning this aspect of school practice. Original records are significant only as they are combined in such a way as to throw light upon the particular problems involved. Of course it is true that reports commonly include much discussion of school policy which is not based in any considerable degree upon school records. But the demand that is being made with increasing frequency that any problem be supported with a statement of the results which may be expected, makes the relationship between records kept in the school system itself, or derived from other school systems, a matter of primary importance even in that part of the report which is frankly a discussion of future development. Indeed, it may well be claimed that it is a primary function of school records to make known school needs.

It is only in recent years that any considerable attention has been given to the form of the records or reports of school systems. A few years ago a report of attendance, giving the total number enrolled and the average daily attendance, would probably have been considered satisfactory. In addition to the record of attendance, one would probably have found a scholarship record kept by each teacher. In the same system one would have found a very simple system of accounting and a report of expenditures distributed among a very few items, such as teachers' salaries, textbooks, stationery, fuel, and possibly a few other items. Quite commonly a large part of the total amount expended was reported as miscellaneous expenses. This tendency to report in terms of totals and averages has been superseded by the demand for all of the facts. Students of education, as well as those who are interested in public enterprises, whether in education or in some other field, have come to realize that it is necessary to know the facts in terms of their distribution, showing the limits or range within which the cases considered lie, the central tendency, variability, and the like, if any adequate interpretation of the situation is to be hoped for. (See GRAPHIC CURVE; STATISTICAL METHOD.) This demand for adequate statistical treatment of school facts is being met throughout the world to-day by an improved system of records and by more adequate reporting. As examples of this development, one might cite the cumulative pupil record card, and the form for reporting fiscal statistics, which have been recently recommended by a committee of the Department of Superintendence of the National Education Association.

Pupil's Records. — Five years ago there were very few cities, probably not more than thirty, in the United States which could, without very great difficulty, furnish a record of a pupil's school life from the time he entered school to the date upon which the inquiry was made. To-day there are more than two hundred cities which have reported to the committee referred to above that they are using a cumulative record card at least as adequate as the one recommended by the National Education Association Committee. A copy of this card is shown on the following page.

Such a cumulative record should be kept for every child throughout his entire school career. From such a pupil record it will be possible at any time during the pupil's attendance in public schools to determine: (1) the amount of attendance of individual pupils for one year; (2) comparative rates of progress in schools having school terms differing in length; (3) classification of pupils by age and grade; (4) classification of pupils for enrollment date — (*a*) duplicate enrollment in the school, (*b*) duplicate enrollment in other public schools in the same town or city, (*c*) duplicate enrollment from other public schools in the same state, (*d*) original enrollment from all other sources; (5) the number of times a child has been detained in a grade; (6) foreign birth or parentage as affecting progress; (7) kindergarten training as affecting progress; (8) transfers as affecting progress; (9) the

CUMULATIVE PUPIL RECORD CARD

ELEMENTARY SCHOOL RECORD SYSTEM — PROMOTION RECORD

This card is to pass from teacher to teacher or from school to school as the pupil is promoted or transferred. It is to be filled out and sent to the principal's office when any change is made requiring a change in the office records. It is then to be sent to the teacher who has the pupil.

(a) SCHOOL	(b) DATE OF ADMISSION	(c) AGE SEPT. 1		(d) GRADE	(e) ROOM	(f) DAYS PRESENT	(g) HEALTH	(h) CONDUCT	(i) SCHOLARSHIP
		Years	*Months*						
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(1) 1. Last name ....

(2) First name and initial ....

ELEMENTARY SCHOOL RECORD SYSTEM — ADMISSION, DISCHARGE, AND PROMOTION CARD

(3) Place of birth ....

(4) Date of birth.

(5) Vaccinated.

To be kept for every pupil and sent with the pupil when he is transferred to any school, either public or private, in the city or outside the city. Great care should be used to have the names complete and correct.

Write all dates as follows: 1912-9-25.

(6) Name of parent or guardian.

....

(7) Occupation of parent or guardian.

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(8) Residence. (Use one column at a time. Give new residence when pupil is transferred.)		(9) Date of discharge.	(10) Age.	
			Years	*Months*
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When a pupil is permanently discharged to work, to remain at home, or because of death, permanent illness, or commitment to an institution, this card is to be returned to the principal's office and a full statement of the cause of the pupil's discharge is to be made in the blank space remaining above.

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effect of attendance (or absences) on progress; (10) inquiries having to do with individual school management, as well as many other valuable and interesting facts about school children.

Distribution of Pupils. — Any adequate study of school organization involves a consideration of the distribution of children by ages and grades. An age grade table is now commonly found in school reports.

Instead of the reports which give the average daily attendance of pupils, we are coming to have reports which tell the whole truth about attendance by distributing the number of days attended, as is indicated in the following table: —

DISTRIBUTION OF ATTENDANCE

TIME	BOYS	GIRLS	PER CENT OF WHOLE NUMBER
Attending less than 10 days			
10 days to 19 days			
20 days to 29 days			
30 days to 39 days			
40 days to 49 days			
50 days to 59 days			
60 days to 69 days			
70 days to 79 days			
80 days to 89 days			
90 days to 99 days			
100 days to 109 days			
110 days to 119 days			
120 days to 129 days			
130 days to 139 days			
140 days to 149 days			
150 days to 159 days			
160 days to 169 days			
170 days to 179 days			
180 days to 189 days			
190 days to 199 days			
Total (equal enrollment for term)			

In like manner, tables which give enrollment, promotions and non-promotions by grades and by causes, failures by studies and by grades, withdrawals by ages, by grades, and by causes, are becoming more and more common in school reports.

Fiscal Statistics — The demand for better fiscal statistics is well illustrated by the form recommended by the National Education Association Committee. (See U. S. Bureau of Ed. *Bulletin No. 3*, 1912.)

A few years ago very few cities could have distributed their expenditures in any such manner as is indicated in this form. It was not common either to indicate as clearly as is demanded above the purpose for which money was spent, or the particular type of institution or activity for which money was used. There are to-day four hundred and eighteen cities reporting to the National Education Association Committee that their system of accounting enables them to give reports at least as adequate as that indicated in this form. This means, of course, that there has been in recent years an increased addition to the business aspect of school administration. In many cases it means that a special officer, variously called a business manager (*q.v.*), a secretary, a controller, or a school auditor has been added to the staff employed by the Board of Education. Hence, it is now possible, on the side of fiscal statistics, to have reports which attempt to analyze expenditures in such a way as to show the total cost per pupil in various grades or types of schools, the cost per pupil for various items, such as instruction, books and supplies, fuel, and the like; and in some cases a careful analysis and comparison is made of costs among the several units of the school system, as, for example, upon the basis of school buildings or plants.

Salary Reports. — Further illustration of the more adequate form of report may be indicated by calling attention to forms of reporting now commonly used in our school reports. It was not unusual a few years ago to have school salaries reported as a single item. Manifestly the truth about salaries can be known only when we know how many teachers receive each of the several amounts, as indicated in tables like the following, which are now not uncommon: —

NUMBER OF ELEMENTARY-SCHOOL TEACHERS WITH SALARIES —		NUMBER OF HIGH-SCHOOL TEACHERS WITH SALARIES —	
Below $350		Below $500	
$350 to $400		500 to 600	
400 to 450		600 to 700	
450 to 500		700 to 800	
500 to 550		800 to 900	
550 to 600		900 to 1000	
600 to 650		1000 to 1100	
650 to 700		1100 to 1200	
700 to 750		1200 to 1300	
750 to 800		1300 to 1400	
800 to 850		1400 to 1500	
850 to 900		1500 to 1600	
900 to 950		1600 to 1700	
950 to 1000		1700 to 1800	
1000 to 1050		1800 to 1900	
1050 to 1100		1900 to 2000	
1100 to 1150		2000 and above	
1150 to 1200			
1200 and above			

Securing Publicity. — In the newer type of report, it is common to illustrate with charts, diagrams, and pictures. There is an attempt made to tell the story in such a way as to interest the reader as well as to convey information to the specialist. In some cities definite plans are made for publicity through the newspaper, or in some cases by issuing partial reports on special subjects of interest from time to time throughout the school year.

Report in Cycles. — Another interesting development in modern reports is the appreciation of the fact that it may not be wise to attempt to cover every subject with equal completeness each year. It may be argued that the best report is the one which specializes upon some one aspect of the school problem once in three or once in five years. Of course it is necessary, if such a cycle of reports is instituted, to give the essential facts each year. If, for example, the following cycle were followed: first year, curriculum, including special schools and special classes; second year, finance; third year, pupils; fourth year, teachers; fifth year, buildings and equipment, — the report would undoubtedly convey certain information concerning each of these fields each year. On the other hand, in each of the five years the topic which was considered the special order for the year would be treated exhaustively. In so far as statistics or reports are valuable for the guidance of those who administer our schools, there would be great advantage in the adoption of some such plan as indicated above.

To have an exhaustive treatment of a topic once in five years would be just as satisfactory as to have the topic treated with like fullness each year. Since space and effort must be economized, there is manifestly a very great advantage in treating in successive years several different topics, and then returning to treat each of these topics again after the lapse of a definite period.

Uniform Reports. — Possibly the most interesting development in recent years is found in the demand for uniformity in recording and reporting. Our state education officers have demanded uniform reports within the state. For the most part, these reports have been very inadequate, and have been thought of as significant mainly in so far as the information derived was used as a basis of determining the aid given to the local community from the state. The movement for uniformity, which has taken form in the National Education Association in the appointment of a special committee on uniform records and reports, may be expected in time to affect the state officers as well as city school systems. This committee has, since its appointment, worked in coöperation with the United States Bureau of Education, the Census Office, and the Association of School Accounting Officers. These four bodies have agreed upon a uniform program. The United States Bureau of Education has from time to time modified its schedules in accordance with the recommendations of the joint committee. The Bureau has also invited state and city superintendents for conferences, and has sent out its forms for criticism to city and state officers before issuing them in permanent form. It is to be expected that from this campaign of education there will come a realization of the importance of uniformity as well as greater interest in records and reports. Uniform reports will enable school administrative officers to study more adequately their own situation in the light of a comparison with other similar areas.

Hope for more adequate recording and reporting is to be found, too, in the increased demand made upon those who would enter the profession. Courses in school management and in school supervision and administration in normal schools and colleges are to-day sending students into the field with some appreciation of statistical method, and with some acquaintance with the best practice with respect to records and reports. The movement for adequate records and reports is a part of the development of a science, as well as of a profession of education. The demand upon the part of the public for such adequate information is even greater than the demand for efficiency in teaching. G. D. S.

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RECREATION. — See GAMES; INTEREST; PLAY; SESSIONS, LENGTH OF; WORK.

RECREATION CENTERS. — See PLAYGROUNDS.

RECREATION PIERS. — See PLAYGROUNDS.

RECTOR. — A term used frequently of the chief officer of a school or university. It is found in the sense of schoolmaster, tutor, or preceptor in the Roman writers of the first century A.D. And it may be that it was this use of the term which was revived in Germany and Scotland (as early as the twelfth century) for the head master of a school. In Scotland the term is in a few cases synonymous with *Magister Scholarum.* In Scotland the head master of the high school is still called Rector. In Germany the title *Rektor* is still used for the principals of secondary schools in Saxony and Württemberg; in Prussia secondary school principals are called *Direktoren*, but principals of elementary schools are known as *Rektoren.*

The term is, however, in more general use in connection with university administration, and in this use goes back historically to the University of Bologna. It seems now well established that the term was borrowed from its use in Lombard towns to refer to the chief magistrate. The Rector of the University was thus the chief executive officer. At Paris each nation had a "rector" until the four nations combined to have one rector over the whole body of students, the heads of the nations later being called proctors (*q.v.*). At Oxford and Cambridge the term "rector" was for a time equivalent to proctor. At present it is used only of the heads of Exeter and Lincoln Colleges, Oxford. In Scotland the position of Rector or Lord Rector of a University is honorary and is bestowed by election among the students upon men who have distinguished themselves in public life. In France the *Recteur* is the official head of an Academy with particular charge of the University. The term is not used in America, but for a few years subsequent to 1676 the title of the President of Harvard College was changed to Rector. The term is regularly used of the heads and principals of Catholic colleges and seminaries all over the world. See, for further details, UNIVERSITIES; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN; ITALY, EDUCATION IN; SCOTLAND, EDUCATION IN; PROCTOR, etc.

REDISCOVERY, METHOD OF. — In the teaching of science and mathematics, the method of using objective materials and laboratory experiments is a matter of controversy. Three views are held as to the way in which data should be presented: (1) The order of experiment should be that of the original discovery, the experimentalist rediscovering the conclusion. This is the so-called heuristic method, the method of discovery or rediscovery. (2) The procedure should be that of mere verification or proof, the facts being presented, without regard to the original mode of research, in the most economical order consistent with bringing about conviction in the learner, scientific standards of truth being kept in mind. (3) The method should be that of personal inquiry or investigation on the part of the student, a problem for solution being presented to the student who is to use all his knowledge and ingenuity in devising ways and means, the instructor being secondary and merely supervisory.

The worth of these methods has been much discussed, particularly in the objective teaching of mathematics in the primary school and in the laboratory teaching of physics and chemistry in the high school. Present tendency seems to favor the large supplementary use of the two latter methods. The two abilities requisite in adult life are (1) the common ability to appreciate proof and to verify conclusions, and (2) the less common ability to conduct an investigation on unsolved problems. A reproduction of various steps in so-called rediscovery (heuristic method) is open to the objection that in no essential psychological sense is it true discovery or rediscovery. The child is not conscious of the problem, to begin with, nor is he mentally pushed to devise the successive stages; too often he goes mechanically through an order prearranged by the laboratory manual or teacher. He gains a proof, but in a wasteful manner. The method of verification gives all that so-called rediscovery does, and does it more clearly and more economically. The occasional use of the method of personal inquiry gives what is aimed at in rediscovery. Its occasional use establishes the use of the child's capacities in real scientific inquiry. It begins with a problem in which the student himself is interested, and which stimulates him to the suggestion and criticism of ways and means and to the making and checking of conclusions. The relative use of verification and inquiry as supplementary methods depends on the intellectual maturity of the child and the complexity of the problems presented.

H. S.

See Discovery, Method of; Science, Teaching of.

REDUPLICATION THEORY. — See Culture Epochs; Instincts.

REFLECTION. — See Thinking.

REFLEX, REFLEX ACT OR ARC. — See Instinct; Nervous System.

REFORM SCHOOLS. — A term used with various significations. In Germany it refers to the modified gymnasium where Latin is begun in the third and Greek in the fifth years. The system is adopted to avoid the evil of too early determination of the scholastic and vocational career of the child. (See Germany, Education in.) In England and elsewhere it is sometimes used to indicate schools representing a radical departure from traditional methods and curriculum. This type is more particularly defined under the caption Experimental School (*q.v.*). In the United States the most common use of the term is to indicate a class of institutions for juvenile delinquents, which have more of a penal than an educational significance, and it is in this sense that the term is used in the following article.

Origin. — The origin of the reform school is obscure. As early as the seventeenth century in Amsterdam, morally depraved children were segregated, not, however, for the purpose of reformation, but to relieve and protect society. Francke (*q.v.*), in his efforts to save orphans, was the first to suggest the value of separate institutions for delinquents. In Italy, England, and France such social reformers as Cæsar Beccaria, and John Howard urged the separation of juvenile from adult criminals in almshouses and prisons and provision for special treatment. Pestalozzi, at Neuhoff and Stanz, discovered some of the special needs of unfortunate and depraved children.

The earliest formally organized reform schools were a school near Birmingham, 1817, the New York House of Refuge, 1824, the Rauhes Haus (*q.v.*), founded by Wickern (*q.v.*) and his mother, at Horn, near Hamburg, Nov. 1, 1833, and the famous school organized by Demetz, who received the inspiration from a study of American reformatory institutions, at Mettray, France, in 1839. The English school, after a successful existence of several years, was closed because of the death of its founder; the others still exist and have long served as models, especially the French school, regarded as the most noted juvenile reformatory in the world. Schools patterned after these three are now found in every civilized country.

Types and Number of Institutions. — In the United States there are now about 120 public and private reformatory or disciplinary schools, variously named and organized. The earliest schools were much like the House of Refuge in New York City, and a number of them still bear that name. These are situated, as a rule, in or very near large cities and have much of the prison about them. After some years of experience such institutions were called "reform schools," or juvenile reformatories, were located in the country, and were more like schools and less like prisons. In recent years, and at present, the term "industrial school" has been applied and well indicates the change in the organization. In some instances the name of a noted person has been used as a title in order to avoid the stigma of an explanatory title. The three kinds of names fairly well indicate the growth of the ideals of reformation. Some older institutions still exist largely unaffected by progress, but in the main there has been improvement, and never more than in the present decade.

Nearly all of these schools are supported by public funds either directly, as in the case of a state reform or industrial school, or indirectly, as where a certain per capita amount is paid by the state, county, or city for maintenance of some private institution. Subsidizing private agencies is done upon the claim that the same service can be secured at less cost to the state — charity, philanthropy, and religion supplying the deficit — and that private care is more acceptable to certain parents. Of necessity the per capita cost, varying from $100 to $300 per year, in both is very much greater than in the case of the normal school child. In the Middle and Western states these schools are supported entirely by the state, or city in the case of parental schools, while in the older Eastern states, notably New York, private and religious bodies share the duty. Where there is a cosmopolitan population there is a tendency to place delinquent children in institutions of the parents' faith. As public funds cannot be used to maintain institutions under religious control, various private schools have been organized. For this reason, four kinds of reformatories for each sex exist in some of the older states — state, Protestant, Catholic, and Hebrew.

The Catholic Protectory, with three divisions — one for girls, one in New York City, and one in the country for boys — is the largest correctional school in the world. While the children are given excellent trade training and a good literary education, stress is laid upon religious training. The Jewish Protectory at Hawthorne, N.Y., is a model of location, organization, and equipment.

Control. — The control of reform schools is usually vested in a board appointed by the Governor, or in a board made up of members of the same religious faith. State reformatories are classified and managed by the same authorities which control the penal institutions. Efforts have been made to make the reformatory a part of the state school system, but without success. Such a change would involve a complete change in ideals and organization. As a rule, men and women experienced in prison management are in charge. Where school men have been tried, they have usually failed. As reform schools are historically penal, it may be unwise to attempt to change them into special public schools. On the other hand, parental schools, of which there are an increasing number, are offshoots of large public school systems. The spirit and organization are essentially those of a school. The two types of such different origin may in time grow into the ideal institution for the prevention of crime and the reformation of the wayward.

Types of Housing. — The three kinds of housing, congregate, pavilion, and cottage, found in eleemosynary institutions are used in reform schools. The early institutions of both Europe and America were all of the congregate type, although Volmarstein established two reform schools, one in Overdyk (1816) and another at Dusseltal (1822), upon the decentralized plan. Wickern used the same system at Horn (1833). In recent years the cottage plan has become popular with boards, a good many schools abandoning old congregate buildings and erecting, with pupil help, cottages containing from fifteen to fifty pupils, in addition to officers. The cottages of the New York State Training School for boys at Lake Mahansic are to house fifteen boys and two employees. The distribution and location of the cottages are important. In the above institution — a model of its kind — the cottages are in three groups, the industrial group, with cottages 300 feet apart; unskilled laborers' group, for boys who need very close supervision, houses near each other; and the agricultural group, with cottages at least 500 feet apart. A number of individual cottages are isolated in order to foster as much family atmosphere as possible. One obstacle to the growth of the small cottage plan is its cost.

Commitment. — The age and conditions of commitment vary somewhat. Few boys are committed before their eighth, and, as a rule, none are accepted after their sixteenth birthday. Girls may be committed at eight but seldom are; they are received up to eighteen years in some states. The average age of girls in a reformatory is always higher than that of boys. There are seven boys in the reform schools of the United States for every two girls. The average age of commitment in the larger institutions is fourteen years three months for boys and fourteen years nine months for girls. The term of commitment varies in length from a few months to several years. In most cases, the sentences are for one year, eighteen months, two years, or until the person becomes of age. In Great Britain and Ireland, the Children's Act of 1908 makes the penal age twelve years. Below that age children accused of crime for the first time may be sent to an industrial school; also children between twelve and fourteen years, if it is their first crime. Others under sixteen years can be sent to reform schools. In France the act of April 12, 1906, places the penal ages from twelve to eighteen years. In the German Empire the ages are the same. The orphans' court, however, may commit a younger child. The institution authorities determine the time of detention, although no delinquent may be detained longer than his twenty-first birthday. April 17, 1909, the Russian Emperor took under his protection all institutions for the reforming of minors, and established a new plan of treating offenders of a tender age. The new laws are similar to those in the other nations. In Holland the penal minority is eighteen years. Between sixteen and eighteen the judge may consider them as adults. There is a tendency to give the institution custody of the delinquent until twenty-one years old, especially in the case of girls. The parole and probation systems have shortened the term of commitment, but lengthened the period of custody. Reform school authorities complain because of the short sentence — it gives so little time in which to establish new habits and, without probation, often leads to recommitment. As better facilities are developed for after care it is likely that the control of delinquents will be extended to the end of minority.

Discipline is the watchword of the reform school. In the early schools the discipline resembled that of the prisons. Reformatories still exist where boys or girls are locked into cells each night, surrounded all day by high stone walls, and marched in squads from one task to another. Such institutions are in charge of penologists. Fortunately there are other institutions where none of these forms of discipline exist. It is difficult to get away from the idea of punishment as the basis of discipline, to training as such a basis. The credit system is in common use. The boy receives credit for good conduct and demerits for misbehavior. Nearly all items of bad conduct are valued in demerits and range from impudence to escape. By continued good conduct the boy earns a parole in about three quarters of the term of his sentence. While on parole he must report in person or in writing at regular intervals to the school; he is regularly visited by a parole officer. Effort is made to place the boy in a good environment. There is an increasing amount of parole work, and the results are generally good. However, it is hard to find suitable homes for some. Colored girls are difficult to place out, as are mildly feeble-minded cases. A few states are now making provision for the latter class in separate custodial institutions.

Daily Program. — The daily schedule of duties of a reform school boy attempts to use all of his waking hours. While there is play or recreation, it is usually under supervision, — always under surveillance. The following is an average schedule: —

5:45 Reveille.
6:15 Waiters and kitchen boys report.
6:30 Breakfast.
7:00 Details for work.
9:00 Details for school and industrial training.
11:30 Prepare for recall.
11:45 Waiters report.
12:00 Dinner.
12:30 Details for kitchen.
1:30 School and industrial training.
3:30 Recreation.
4:00 Military drill.
4:30 Recreation.
5:40 Waiters report.
6:00 Supper.
6:30 Reading and games.
8:30 Taps.

School work and industrial work alternate each half day. The course of study is a simple one, and emphasizes the rudiments, for as a rule the pupils are far behind in their studies. The average classroom instructor is below the standard of the public school, skilled teachers being difficult to secure. The industrial work is better than the school work for two reasons, — the pupils like such work better than the classroom exercises and it is usually possible to secure better teaching. The range of agricultural instruction includes farming, gardening, horticulture, stock raising; all are profitable to the institution and popular with most boys. In American institutions, however, where city boys are committed, the agricultural occupations are not popular with the majority. The trades, printing, painting, papering, and decorating, shoemaking, tailoring, plumbing, gas fitting, etc., are taught in all the large reformatories. Often the motive is occupation and product rather than training. Some boys and girls acquire skill in the trades, but the majority get little. The time is short, the pupils unwilling, the teachers often uninteresting, and an educational motive absent. Improvement in industral training is noticeable, however.

Classes of Delinquents. — Institutions for the reformation of incorrigible minors recognize two classes of delinquents. One type exists for the prevention of crime and the correction of younger children, really misdemeanants; the other for the older and more depraved. The first type is of more recent origin and is more effectively reformatory. A good example is the New York Juvenile Asylum or Children's Village, at Dobbs Ferry, admitting truant and disobedient children between the ages of seven and sixteen years. England has a large number of schools of this type.

Tendency. — The tendency is toward adequate buildings, better organizations, kindlier discipline, more agricultural and industrial training, and more generous support. Institutions are being located in rural communities. In most states and countries children are the legal wards of the state until their majority. Placing out in good homes under state supervision is increasing. Two types of schools are developing, one preventive, the other curative. More attention is given to the problem of reformation, it being now regarded as a question of reëducation rather than one of retribution. While the percentage of reformed delinquents is still low, the outlook is promising. A. H. Y.

The Industrial Schools of Great Britain are perhaps the most important and most numerous type of reform schools. They are under the control in England and Wales of the Home Secretary and in Scotland of the Secretary for Scotland. They grew out of the ragged schools (*q.v.*), but the first legislation concerning them was in 1854 in Scotland and 1857 in England. These acts, with their amendments, go down to the famous children's act of 1908, the so-called "Children's Charter." These schools are of various types, including town or country schools, town schools, surburban schools, ship's schools and girls' schools. They number in all 140; 108 in Great Britain, (including eight schools for mental defectives) and 32 in Wales and Scotland. They maintain about 18,000 children. In the investigation of these schools now being made by the government the transference of these schools to the board of education is being considered. The entire subject is dealt with in detail from various angles under different captions. For the general legislative and social background see the article on CHILDHOOD, LEGISLATION FOR THE CONSERVATION OF, and those on JUVENILE DELINQUENCY, JUVENILE COURTS, and JUVENILE PROBATION; for those dealing with the defectives, see DEFECTIVES, EDUCATION OF and SPECIAL CLASSES; for a closely related type see the article on POOR LAW AND EDUCATION.

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WENTWORTH, E. P. Minority Commitments to Juvenile Reformatories. In *Proceedings*[1] of Eighth Annual Conference on "The Education of Backward, Truant, and Dependent Children," 1911.

REFORMATION, THE, AND EDUCATION. — There are few subjects on which greater diversity of opinion has been and is expressed than on the relation of the Reformation to education, the natural result of the diversity of opinion which has been and is held as to the Reformation itself. One point, however, recent research has now definitely settled: that neither in institution, method, nor matter is the education of post-Reformation times separated by any great gulf from that of pre-Reformation times. The Reformation was undoubtedly a revolution. But as is the case with other revolutions the change it effected has been exaggerated alike by its friends and by its foes. Neither in Germany nor in England nor in Scotland is it now possible to believe (except by those who either have not seen or refuse to look at the evidence available) that Luther or Cranmer or Knox created a new heaven and a new earth in the sphere of education or that the schools of those countries, and by consequence of America, were a new birth due to the genius of the reformers. In every branch of life research tends to show that growth never proceeds *per saltum*. In education, above all, the continuity of institutions from the ancient to the modern world has now been demonstrated. An initial difficulty in discussing the relation of the Reformation to education is that of settling when the Reformation took place. It might be dated from Wycliffe or from Petrarch as well as from Luther or Erasmus. Certainly it is only a particular manifestation of the Renaissance (*q.v.*), itself as undefined and almost as undefinable a term and period as the Reformation.

Germany. — The Renaissance in Germany is closely related to the Reformation, especially in its spirit and in its outcome. The characteristic features of this twofold movement in the north arose from the fact that the civilization of the Latin countries was based directly upon the ever-present classical institutions, while the civilization of the Teutons was a direct outgrowth of their Christianization and its consequent moral and religious bent. Hence the logical outcome of the reformers' work would have led to a continuous development of the Renaissance emphasis upon the use of reason as the guide to the interpretation of secular life and of nature, upon the restriction of the authority of the Scriptures to religious matters, and upon the use of reason by the individual even in the interpretation of the Scriptures. But the tendencies in all of these lines were checked before the expiration of a single generation, and so we find Luther, who had earlier called reason "a something divine," towards the close of life holding the view that "the more subtle and acute is reason, the more poisonous a beast, with many dragon's heads, is it against God and all His works." While on the one side the Renaissance-Reformation period is marked by the humanistic tendency, on the other it developed into a narrow formal scholasticism. Theoretically, the doctrine of the Reformation involved liberty of conscience, in practice intolerance and bigotry prevailed. Religious thought was compelled to flow in the channels marked out for it by the rulers of the numerous political divisions. Not only was intellectual life thus bound within narrow limits, but the education of the schools, higher and lower, took its purpose and received its spirit from the same formal and narrow interest. Hence it was that the Reformation failed to produce during the sixteenth century those intellectual and educational results which were logically involved in the basal positions of the reformers so far as these related to free learning, the spread of culture, and the development of science. The very fact that the Reformation was a revolt against existing conditions was calculated to introduce chaos, and it is difficult to agree with those who would minimize the educational provisions existing before the Reformation, for the purpose of exaggerating the immediate effect of the Reformation. It is clear from contemporary statements that the Reformation failed to produce during the sixteenth and seventeenth centuries the intellectual and educational results anticipated. Thus Erasmus, in writing to Parkheimer, says "Where Lutheranism rules, there the sciences are neglected," and elsewhere he writes of Luther that "he loads the classical studies with hatred and contempt which is fatal to us and not helpful to him." And Luther himself may be quoted; in a letter to the Burgomaster and Council at Rothenburg in 1533 he writes that "there is a great and sad deficiency in learned people . . . so that many parishes and schools are left vacant," and in his sermon *On Sending Children to School* he laments the decline of the higher schools at Erfurt, Leipzig, and elsewhere. At the same time, a few of the Reformation leaders were opposed to the new learning; both Melanchthon and Luther attack higher schools and universities as "the devil's schools," but they were willing enough to call in the new learning to their aid as a means. But there were other reformers, as Professor Karlstadt of the University of Wittenberg, who was opposed to learning of any kind, because "all knowledge of the Holy Spirit worked through faith."

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[1] Above *Proceedings* can be obtained from Supt. Elmer L. Coffeen, Supt. Lyman School for Boys, Westboro, Mass., $1.00.

But if learning declined for a brief period or tended to develop a spirit of formalism and narrowness, educational activity was none the less great throughout the sixteenth century. Something had to be done to replace the old system of education, which the Protestant revolt had undermined, but while new systems were established, their development was along different lines. These systems were based upon the idea of universal education, but their chief function was to develop the religious practices and beliefs, and the ecclesiastical affiliations and interests of the child, for upon these depended his eternal welfare. Since in theory the eternal welfare depended upon the application of his own reason to the revelation contained in the Scriptures, it became necessary to give ability in reading and to train the rational powers. Religious material, and the linguistic training necessary for the use of such material, constituted the bulk of the subject matter. Such methods were used as would cultivate a respect for authority and tradition, and would produce a dialectic ability in exposition and argumentation. On the institutional side of education, the schools were either controlled completely by the Church or, in many Protestant countries, by both State and Church; for even where the State exercised formal control, both the teaching and the direct supervision were chiefly in the hands of ecclesiastics. The full development and completion of the educational principles involved in the Reformation awaited the growth of the political idea that the welfare of the state depends on the education of the individual citizens.

In practice, the schools were accordingly intended in the main to give suitable preparation for religious life and study. Educational theory, however, was more progressive. Luther (*q.v.*), in a well known passage, says: "Were there neither soul, heaven, nor hell, it would still be necessary to have schools for the sake of affairs here below. . . . The world has need of educated men and women to the end that the men may govern the country properly and that the women may properly bring up their children, care for their domestics, and direct the affairs of their households." Schooling was to be brought to all the people, noble and common, rich and poor; it was to include both boys and girls — a remarkable advance; finally, the state was to use compulsion if necessary. Nor was the elementary curriculum to be confined in the main to religious instruction; "My opinion is that we must send boys to school one or two hours a day, and have them learn a trade at home for the rest of the time. It is desirable that these two occupations march side by side." In the secondary schools Latin and Greek constitute the bulk of the curriculum. To these languages Luther adds Hebrew, and also attempts to bring this linguistic education within the reach of all. Room is also found for the logic and mathematics demanded by the times and a new emphasis is laid on history, science, and music. Finally, as a city is at a great expense each year for the construction of roads, the fortifying of ramparts, and the equipment of soldiers, it should for its own defense and prosperity support one or two schools, and make attendance compulsory.

The practical outcome of the Reformation influences is seen in the number of church and school ordinances, visitations, and general articles. Educationally these different measures aimed to secure school facilities with adequate support, the selection of suitable teachers, and the provision of supervision. The end aimed at was, as already stated, instruction which would enable the people to follow church services intelligently. The leaders of the Reformation naturally took an active part in drawing up the church and school ordinances. Thus Luther took part in framing the *Kirchenordnungen* of Wittenberg (1523), Leisnig (1523), and Madgeburg (1524), all of which contained educational provisions. But Melanchthon more than any other person was concerned either entirely or in part in framing such ordinances, in general, however, for secondary schools (Latin schools and gymnasiums). He was connected with the following systems, Nuremberg (1526), Saxony (1528), Herzeberg (1538), Wittenberg (1545), Eisleben (1525), Cologne (1543), Mecklenberg (1552), Palatinate (1556), Pfalz-Zweibrück (1557). Bugenhagen (*q.v.*) was almost as active in northern Germany, producing ordinances for Brunswick (1528), Hamburg (1529), Lübeck (1531), Pomerania (1535), Schleswig-Holstein (1537), Brunswick-Wolfenbüttel (1543), and Hildesheim (1544), etc. The work of these two men served as models for innumerable others. The most comprehensive of the early school ordinances is that of Württemberg (1559). The early Saxony ordinance of 1528 had dealt merely with secondary schools. The Württemberg ordinance provided a system of schools for all the people, from vernacular schools, teaching reading, writing, religion, and sacred music, through Latin schools with six classes, up to the university of Tübingen. The Saxony plan was revised in 1580 to incorporate the elementary schools, and borrowed largely from Württemberg. Other states and cities adopted similar systems, but it was not until 1619 that compulsory education for all children from six to twelve was introduced, in Weimar. The culmination was reached in Gotha in 1642, where the first really modern system was introduced by Duke Ernest the Pious (*q.v.*). (See GOTHA, SCHOOL REFORM IN.)

The history of the universities of the German states during the sixteenth and seventeenth centuries is determined by the progress of the Protestant religion, and is almost identical with the development of Protestant theology. Wittenberg, founded in 1502 as the first university of the new learning, became through the residence of Luther and Melanchthon the very center of Protestantism. The universities gradually threw off their allegiance to the pope and transferred it to the temporal princes. Since their support was now derived from the favor of these governments instead of from ecclesiastical sources, the control exerted by the princes became determinative, and many of them followed the occasional change in denominational adherence of the reigning families. To a considerable extent their support came from the dissolution of old monastic and ecclesiastical foundations. Marburg, founded in 1527, was the first of these Protestant Universities, while Königsberg, Jena, Helmstedt, Dorpat, and a number of others were added within a century. Within this same period seven Roman Catholic universities were founded within the limits of the German states. Several during the same period grew out of gymnasien, as the one at Strassburg (1621) from Sturm's school, and the one at Altdorf (1578) from a famous institution at Nuremberg. Both of these were Protestant. While the work in many of these was of a high character, and the influence great, — Altdorf, for example, though very poor, is said to have contributed more to philosophical study than all of the universities of the British Empire, — yet, in general, by the seventeenth century the activities of these institutions degenerated into the lifeless formalism previously mentioned. A German historian remarks that the dominant theological interest "called into existence a dialectic scholasticism, which was in no way inferior to that of the most flourishing period of the Middle Ages, either in the greatness or minuteness of the careful and acute development of its scientific form, or in the full and accurate exhibition of its religious contents." I. L. K.

See further GERMANY, EDUCATION IN; BUGENHAGEN, JOHANN; KIRCHENORDNUNGEN; LUTHER, MARTIN; MELANCHTHON, PHILIP; NEANDER, MICHAEL; STURM, JOHANNES; TROTZENDORF, VALENTIN, etc.

England. — Fortunately for the cause of culture and educational progress, England, the birthplace of Protestantism, revised the principles which it had almost trampled out, when they were reimported as "made in Germany." The seeds of Wycliffism were still living when the London grocer who founded Sevenoaks Grammar School in 1432 expressly provided that its master was by no means to be in holy orders, and when the Town Council of Bridgnorth in 1503 made an order that "there shall no priest keep no school after that a schoolmaster cometh to town but that every child do resort to the common (*i.e.* public) school." Colet, Dean of St. Paul's, who traveled with Erasmus, derided the relics at Canterbury; and in the catechism in English which he gave for use in his St. Paul's School (augmented and refounded in 1510 to 1512, the government of which he transferred from his own chapter to the lay Trade Company of Mercers) he defined "the Communion of Saints" in the Creed as being "the clean congregation of the faithful people in grace and communion of saints only in Christ Jesus," words almost precisely the same as those afterwards used by Luther to define the Church. When Bishop Waynflete in 1480, Bishop Alcock in 1496, and Bishop Fisher in 1510 suppressed Selbourne Priory and St. Radegund's nunnery and St. John's Hospital to find endowments for Magdalen, Jesus and St. John's colleges, the spirit of the Lollards was not dead, and the doctrine of Luther was anticipated. The two great colleges founded by Cardinal Wolsey, who had himself begun life as Headmaster of Waynflete's Magdalen College School at Oxford, for university scholars at Cardinal College (now Christ Church), Oxford, and grammar scholars at Ipswich, depended on a Papal bull of 1523, which suppressed some thirty priories, to provide the endowment. The Ipswich College alone, for only fifty scholars, against the seventy of Winchester and Eton, was endowed with ten suppressed priories headed by that of St. Peter's.

But perhaps the most remarkable instance of the attitude of even the highest placed in Church and State is the meeting summoned by William Warham, Archbishop of Canterbury and ex-Chancellor of England, in pursuance of a letter from Wolsey, Archbishop of York and Chancellor of England, in June, 1525, at Tonbridge, Kent, to discuss with the inhabitants, apparently at the suggestion of the rector of Cranbrook, the conversion of their Priory into a "free scole of gramer" for forty "scolars, mennys children of those parties, and they afterwards to be promoted to Oxford, having exhibition for their fynding at scole there." The majority of the inhabitants indeed declared that they think it "more expedient to have the continuation of the said monastery." In consequence, the erection of Tonbridge school was deferred for another generation. But nothing can be more significant of the general attitude of mind toward the most striking result of the Reformation, the suppression of monasteries, than this meeting discussing the conversion of the Priory into a school with less heat than they discuss to-day a new scheme of the Board of Education or the Charity Commissioners. Such straws as these show that the wind which blew down the monasteries in England did not arise from the breath of King Henry VIII desiring to substitute a young and pretty for an old and ugly wife. Henry VIII, the most absolute monarch in Europe at the time, did not precipitate, but delayed and diluted, the Reformation in England. For this very reason when it did come its two great manifestations, the repudiation of Rome and the dissolution of the monasteries, were effected with far greater suddenness and far more startling completeness in the centralized government of England than in the semidetached states of Germany.

Reconstruction took place as rapidly as destruction. Thus the monastic priory of Durham was surrendered to the Crown on December 31, 1540; on May 12, 1541, it was refounded as a church of secular canons and reëndowed four days later. At Canterbury, the chief and greatest of the monastic cathedrals, the transmutation was even more rapid. The surrender took place in March, 1541, and the refoundation on April 5, 1541. In both places, as in the seven other cities in which the secular clergy had in the tenth, eleventh, and twelfth centuries been turned out of the cathedrals for monks and in which the monks were now in turn ejected for the secular clergy, grammar schools and exhibitions to the universities were made important parts of the new foundations. Winchester alone and Norwich were exceptions. At Winchester the careful Henry, or his adviser Cranmer, very properly thought that St. Mary's College, the great foundation of William of Wykeham, amply met more than all the requirements of cathedral grammar schools (*q.v.*) and did not wish to set up rival schools or reduplicate functions. The town of Norwich had petitioned for a hospital served by Augustinian canons for a magnificent new schoolhouse; and Henry provided for this by his will as he had not had time to carry it out in his lifetime, and it was completed by the Protector Somerset.

There had been, of course, grammar schools under the control of the bishops, not of the monks, in all these places before, but they were unendowed and formed no part of the monastic foundations, and a dozen charity boys serving as choristers had been maintained and educated in their almonry schools (*q.v.*). The new schools were placed in a very different position, with salaries for the masters double those of the two great schools, Winchester and Eton, and provision for boarding scholarships on their model, ranging from fifty at Canterbury to eighteen at Durham, in addition to song schools for the choristers varying from ten to six in number. Similar provision was made in the five new cathedrals established out of monasteries where there had been no bishops' sees before, including Westminster. In none of these places had there been endowed grammar schools, or at least not adequately endowed, nor except as regards the almonry boys was education at all maintained or subsidized, taught or governed, by the dissolved monasteries. In all of them Greek was for the first time required of the head master, though Latin only of the usher. The addition in a single year therefore of ten great public boarding schools richly endowed and with ample university scholarships, no less than twenty-four at Canterbury and twelve at Worcester, to the provision made for the highest education was a record in the history of schools. This is a remarkable refutation of the views of the feeble-minded semi-Reformers of the day and their lately resuscitated theories that the Reformation did not advance but retarded education. Nor was this all. Other monasteries were, like Thornton Abbey, Lincolnshire, converted into collegiate churches (*q.v.*) with similar grammar schools attached. But of these it is useless to speak except in vindication of Henry's action, as they were abolished again under Edward VI, Cranmer regarding the canons of collegiate churches as drones little more useful than monks. Further, a considerable number of hospitals for the sick or poor, mostly in the hands of the regular or Augustinian canons, which were dissolved as monasteries, were also wholly or in part converted into schools. (See HOSPITAL SCHOOLS.) Notable among these is the Mercers' School, London, that company having been granted the Hospital of St. Thomas the Martyr (Thomas à Becket) in London on condition of maintaining there a free grammar school for at least twenty-five boys. Further, divers collegiate church schools were now handed over to lay government of town authorities or to church wardens, with augmented endowments, such as Warwick, Ottery St. Mary's, and Crediton in Devon. Many more school foundations were in course of making or negotiation when Henry died, and some of these were carried out under his successor.

In the sphere of university education both Oxford and Cambridge benefited largely from the dissolution, the largest colleges in each being well endowed with monastic property. In regard to Christ Church, Oxford, indeed, the chief credit due to Henry is that he did not put into his pocket, as he was fully entitled to do, the property of the suppressed monasteries which Wolsey had given to Cardinal College, but gave it back to education, with very much less ecclesiastical appendages in the shape of canons and vicars choral than Wolsey had contemplated. Trinity College, Cambridge, founded by Henry in 1544 by the union of two existing colleges, Michael House and King's Hall, owed the bulk of its endowment, which has made it the greatest college in the world with its 800 students, to the dissolved monasteries.

Though Henry, like Luther, stopped short in his religious Reformation, it was owing to his strong will and determined action that the essential steps were taken, the union of churches under a distant despotism broken, and the dead hand of monasticism removed from a third of the lands of England. If any of the reforming rulers is entitled to credit for educational foundations, it is Henry VIII, and not his son, Edward VI (*q.v.*). The bulk of the schools of England in quantity, if not in quality, were connected not with the cathedrals but with the collegiate churches, chantries, and gilds (*qq.v.*). Not less than 200 grammar schools and a larger number of song schools (*q.v.*) were so connected. An act of Parliament had been passed in December, 1545, or January, 1546, giving Henry power to suppress these clerical as he had already suppressed the monastic foundations. He died before he had time to enter on more than a score of them. One of the first acts in the new reign, commonly called the Chantries Act, vested all the endowments of these institutions in the Crown from Easter, 1548, with the express object of the "alteration, change, and amendment of the same and converting to good and godly uses, as in erecting of grammar schools, to the education of youth in virtue and godliness, the further augmenting of the universities, and better provision for the poor and needy." A commission was to be issued to ascertain what the property thus confiscated was, and they or two of them were empowered in every place, where by the foundation ordinance or first appointment a grammar school ought to have been kept, to assign lands of any such chantry for keeping of the school forever. This act purposed to do what Luther in Germany as a pious aspiration only wished, to apply a sufficient part of the funds of the dissolved foundations primarily to education. The Commission was appointed in February, 1548, and its returns were all in by May 31. These returns, known as the Chantry Certificates, are the main and in a number of cases the only source of our knowledge of the schools which existed in England before the Reformation. So completely extinct had this knowledge become before the publication of the educational items in these certificates in 1896, that the very existence of grammar schools before Edward VI was denied, and he was regarded as the founder of the institutions which his advisers set themselves to reform, and in too many cases only succeeded in disendowing and destroying. Foreign wars, domestic rebellion, political intrigue, resulting in an empty exchequer, were the causes which led to the failure of the act. The sale of the chantry lands was a pressing necessity to provide money. The reëndowment of the schools was relegated to a commission of two, who were to cause proper "books," *i.e.* conveyances, to be made for the purpose. But "forasmuch as present order and direction" cannot be taken for them, "our pleasure is that so much money as heretofore hath yearly been employed toward the maintenance of any such schools shall be paid from Easter last" until "other order" can be taken. The commissioners, the chief of whom was Sir Walter Mildmay, who showed himself keen for education in himself founding a college at Cambridge in the days of Queen Elizabeth when he was Chancellor of the Exchequer, accordingly charged on the Crown revenues in each county a yearly stipend for the schoolmasters of the net amount he was found to have received from a dissolved college or chantry. But the sum was fixed. No allowance was made for payments for obits, offerings, or other ecclesiastical incidents, such as in the case of a collegiate church the holding of another chantry in addition to the regular stipend of the schoolmaster, which had added to the attractions of the office and of course ceased with the change in religion and the destruction of the collegiate churches. The sort of difference this made may be seen in the case of Southwell Minster, where the ancient stipend of the schoolmaster was £10 a year, but in 1504 he was given in addition the richest chantry in the Minster, worth £13 6*s*. 8*d*. a year, more than doubling his income. The effect of the Chantry Commission was to reduce his successor to £10 again. Nor was any allowance made for casual receipts from land, such as sales of timber or minerals, and the fines for renewals of leases, which formed the main source of income for other corporate bodies, or the raising of rents as the value of money fell. The kind of difference this made may be seen by the contrast between Berkhampsted School, which, founded only in 1545, had its lands restored to it, probably owing to their being claimed by the founder's heir against the Crown, by act of Parliament in 1549. The rental then was £30 13*s*. 4*d*. In 1813 the master had £5000 from fines and the income in 1877 was over £1200 a year. Where, as at Birmingham, the land given was or became urban, the "unearned increment" was much greater. Birmingham, deprived of the chantry grammar school at Deritend because no foundation deed could be produced to show that one of its priests was bound to keep a school, though he did actually do so, at a salary of £5 a year, acquired instead two thirds of the lands of the Holy Cross Gild, whether by purchase or gift is not clear, producing £25 a year. The earliest extant accounts of the school for the year 1655 show an increase to £27 a year, which by the year 1907 exceeded £40,000 a year, out of which two high schools and seven grammar schools, containing over 1450 boys and over 1267 girls, were and are maintained. Contrast this with the neighboring grammar school of King's Norton, a much larger and better endowed school than Deritend at the time. It was continued by the Chantry Commission at the fixed salaries then received of £15, £10 for master and £5 for usher, reduced by fees of the officials of the Crown to £13 9*s*. The result was that the school was at the time of the Schools Inquiry Commission in 1867 a sham grammar school in which three boys learned Latin and some forty the three R's. In the same county, at Rock, in which the "continued" endowment was £5 14*s*. a year, the income was handed to the rector, who partly paid with it the master of an elementary school, supported by fees and government grant. Such was the fate of the schools existing when Edward VI came to the throne, in cases where later benefactors did not come to the rescue with further endowments.

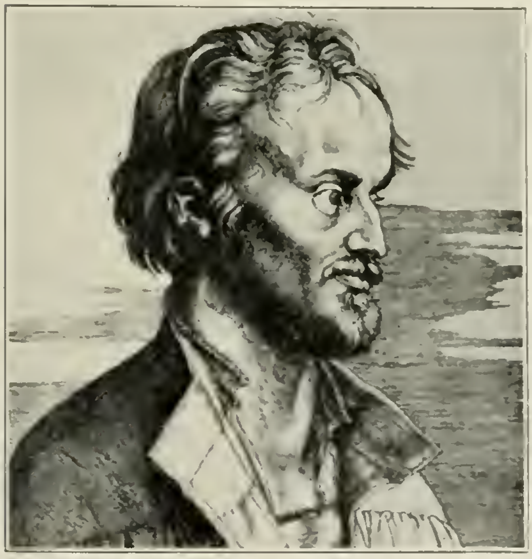
The Commission signified to the commissioners that the king or his "dear uncle," the Protector, would at some later date signify "by word of writing" how many grammar schools there should be in each county and how much endowment assigned to each, by "further order." But the "word" was never written. In most of the schools the "further order" never came.

Organization of Schools. — When we examine their quality we find equally little novelty. One and all, the charters direct that in the assigned town there shall be a grammar school "to be called the Free Grammar School of King Edward the Sixth, to endure forever for the education, institution, and instruction of boys and youths in grammar, and we erect, create, and ordain, declare, and found by these presents that School to consist for ever of one master or pedagogue and one under-pedagogue or usher (hypodidasculus)." In some cases, where the school was smaller, the usher was omitted. Not a word more is said as to the education to be given in them. It was assumed that every one knows what a grammar school education means, and there was no idea of introducing any changes in it. The governors were indeed in every case given power of making statutes for the direction of the masters with the consent of the bishop of the diocese, or, in cases like Sedbergh, where the school was connected with a college, of the college; and the curriculum could be laid down in these statutes. But it was apparently rather the exception than the rule for the statute-making power to be exercised at the time. The conduct of the school was left to the discretion of the master on the very sensible principle laid down by Colet in 1510, "what shall be taught of the maisters and lerned of the scolers it passeth my wit to devyse and determyn in particular." Even Henry VIII, with all his passion for minute legislation, had only laid down for his new cathedral schools that in the fourth form they should be practiced in poetic diction, the familiar letters of learned men, and the like; in the fifth form, in making Latin verses and the translation of the chastest poets and the best historians,

Huldreich Zwingli (1484–1531).
See p. 853.

PETRUS RAMUS MATH. PRO REG.

Peter Ramus (1515–1572).
See p. 105.



Philip Melanchthon (1497–1560).
See p. 190, Vol. IV.

Martin Luther (1483–1546)
See p. 94, Vol. IV.

A Group of Reformation Educators.

and in the sixth, or highest form, in Erasmus' *Copia*, varying of speech in every way, and digesting Horace, Cicero, and other authors of that kind. In fact, it would almost appear that the author of those statutes had before him the curricula of Winchester and Eton in 1530, sent for a model to the newly endowed Saffron Walden Grammar School, so exact is the correspondence. Clearly, neither the comparative reformers of Henry's time nor the radical reformers of Edward's reign conceived the need of reformation in religion as extending to the schools, — except indeed the song schools. These were regarded as nurseries of superstition, their main object being to teach a few boys "to help a priest to sing mass," and little more being taught in them than the bare learning by heart or being able to read without being able to construe or understand the musical parts of the services. "I learn to sing, I can but small gramaire," as Chaucer's song-school boy says. As one great object of the Cranmer reformation was to make the services intelligible, they were to be for the most part read, not sung, and the need for choristers disappeared. So far as they were reading schools, no doubt, their place continued to be filled by the parish clerk till far into the seventeenth century, with the advantageous difference that they taught reading English intelligently instead of Latin unintelligibly. That this was now regarded as tending to reformation and free thought is clear from Bishop Gardiner's action during the reaction to Catholicism under Mary, in imprisoning Grafton for having printed the ABC (*q.v.*) in English, primarily for the benefit of the boys in Christ's Hospital (see Hospital Schools). But English eventually became of universal use in the hornbooks (*q.v.*). Undoubtedly this was an immense advance in education and contributed to the demand which soon sprang up for learned works in the mother tongue. But it was a mischievous mistake to abolish the song schools instead of reforming them.

Universities. — In the university sphere, Edward VI did little. The abolition of chantries in the colleges, setting free their endowments for general college purposes, gave the colleges a slight increase of income. A great law college was designed at each university. At Oxford it was proposed to effect this in a cheap way by transferring all the jurists or law fellows of New College to All Souls and all the artists and theologians of All Souls to New College. So at Cambridge there was a design to merge Trinity Hall, already and still to some extent a legal college, into Clare Hall, in a new "Edward College" with a master, twenty-three fellows, and twenty-eight scholars. This was frustrated by the opposition of Clare, the fellows of which were all theologians. An alternative plan apparently was to make a new college, the master of which was to have annexed to his office the protonotaryship of the Court of Chancery and the vice-president and fellows, all doctors of law, to be masters in Chancery. But this too came to naught, as also did similarly projected colleges of medicine in each university. These colleges might have prevented the university declining as it did, at Oxford at least, into almost purely theological and grammar schools. As it was, the royal visitors, whose mission it was to establish those colleges, gave the universities statutes and injunctions, which left them much as they found them. The lecturer on philosophy was to supplement Aristotle with Plato; the mathematical to add Tonstall and Cardan to Euclid, Mela, and Ptolemy, and so on. Only one grammar school was to be allowed and that at Jesus College, Trinity College being made with much discontent to give up its schools. One notable change was ordered, in that the youth coming forth from grammar schools were to begin with mathematics. In this ordinance may perhaps be found the seed of the fame of Cambridge as a mathematical school. In all the faculties disputations were still to be held three days a week, one of which was Sunday.

It has been often represented that the Reformation caused the universities to decay. The evidence on the subject is complicated. *A priori* it might be supposed that the dissolution of monasteries and collegiate churches and the great diminution consequently in the demand for persons educated to fill them would have caused a great falling off in the numbers at the universities. But we now know that in point of fact very few of the monks ever had been at the university, and that though, as in the case of Prior Selling of Canterbury, the monasteries were sometimes recruited from the fellows of colleges, as a rule they were not, but from grammar school boys. These are oft quoted by Latimer and Lever in their sermons on the falling off in theological students. Lever asserts that there were 200 fewer in divinity than formerly, and 100 of "another sort." But they do not assert a general decline. Against them must be set their simultaneous complaint that "there be now none but rich mens' sons in colleges and their fathers look not to have them preachers." Haddon in 1547 asserts positively that Cambridge was never more prosperous or more numerous, though the "public schools" were so deserted that he had seen a professor lecturing to one pupil. He might have seen that any time in the last thirty years at Oxford, though there is not the smallest doubt that the students there were never more industrious or more numerous. The fact appears to be that the discrepancy of statement is due to the growth of the colleges at the expense of the university. The public lectures were deserted because of the great development of college teaching, especially marked in the statutes of the new colleges of Corpus Christi and Cardinal (Christ Church), at Oxford, and of St. John's and Trinity, at Cambridge. The decline in the theological faculty was more than made up by the growth of the mathematical and law faculties. One main effect of the Reformation was to lessen and completely abolish the clerical civil servant. The offices of the Chancellor, the Treasurer, the Chancellor of the Exchequer, the Secretary of State, the Privy Seal, always formerly held by ecclesiastics, chiefly bishops, were now filled by laymen; and the subordinate officials underwent the same change. There was a great development in the civil service. Hence the decrease in the demand for clerics was more than counterbalanced by an increase in the demand for educated laymen, and without education even the greatest noble could not now expect office. So that while the aristocracy had always sent their younger sons to the universities to prepare for the good things of the Church, they now sent even their eldest sons there, to qualify for the good things of the State. It became the rule for the country gentleman to receive a public school and university education, often followed by a period at the Inns of Court (*q.v.*), too. The tendency which had already begun when Wykeham provided for ten *filii nobilium* as commoners with his seventy scholars, a number doubled by Henry VI at Eton and by Waynflete at Magdalen, was marked by an increase to fifty-four at Trinity College, Cambridge. In nearly all the colleges the numbers of commoners or pensioners began to outstrip the number of scholars. Perhaps the chief and most beneficial effect of the Reformation on education was therefore that while the universities still remained theological seminaries and the majority of scholars and fellows went into the Church, the clerical was so tempered and finally outnumbered by the lay element, that the education of the cleric was no longer purely professional, and while most laymen became more or less theologians, most theologians were laymen in education, and in social life.

Reign of Queen Mary. — The reaction under Mary to a celibate clergy, to monks and friars, and the foreign ecclesiastical government, paid the Reformers the sincere flattery of imitation. Cardinal Pole imitated Wolsey in appropriating a clerical hospital to provide a boarding house for St. Peter's School at York, which, though it failed in its immediate object, still forms the main part of the school endowment. Westminster School remained untouched, though the secular chapter was created for restored monks, and a general decree provided that every cathedral church was to maintain a boarding school for sixty boys on the Winchester and Westminster model. The return to the Latin instead of the English Primer, and the restoration of the old way of pronouncing Greek and Latin, marks the utmost extent of the reaction. Its chief effect was to convince the English nation of the danger of clerical statesmen and to make the Reformers who had fled to Switzerland return with far more radical ideas, evangelical instead of Lutheran, than when they left.

Elizabethan Period. — Educationally the reign of Elizabeth may be divided into two great periods. In the first the effort was to return to the *status quo* of Edward VI's reign and to carry out what had been left unprovided in the reëndowment of the schools. In the second a new development took place towards English and elementary schools. The attribution to her reign of 108 new grammar schools and forty new nonclassical schools, besides twenty-seven and seven additionally endowed (see ELIZABETHAN PERIOD IN EDUCATION), must be modified by an examination of the list of schools in *English Schools at the Reformation.* Of the list of 137 given by the Endowed Schools Commission in 1868, as founded by or under Elizabeth many will not bear examination. For it includes, for instance, the great public school of Westminster (*q.v.*), which in one sense was a foundation of Henry VIII's and in another of Edward III's time, and Hartlebury, the very first on the list, long previously existing; also Bangor, Worcester, Salisbury, Lincoln schools were connected with the cathedrals of the bishops there from time immemorial. Bridgwater, Bristol, Kingston, Abingdon, Darlington, Leicester, Eye, Redford, Bromyard, Thetford, Richmond, St. Alban's, Burford, Horncastle, Coventry, Faversham, Colchester, Cheltenham, Topcliffe, Bungay, Normanton, Wakefield, Ashburton, Chesterfield, Hexham, Newcastle, Bedale, Bodmin, Fotheringay, Leyland, Penrhyn, to name only a few, which have already been shown in print to be of foundation at various dates from the twelfth century downwards, were connected with hospitals, colleges, abbeys, chantries, gilds, and other local corporations. Indeed, the more local and public records are examined, the clearer it is that, in all but a very small minority of cases, the Elizabethan school charters merely confirmed or allowed the resuscitation or augmentation of ancient schools. Among the few really new foundations, and those founded by private individuals, were the two great public schools of Harrow and Rugby, founded, however, as purely local village grammar schools of a low grade, Highgate and Blundell's School, Tiverton. Chief of all was Merchant Taylors in London, by far the largest school of its foundation up to that time, being for 250 boys, of whom 150 were not to be free scholars but to pay for their education, a most striking instance of the new importation of the civic laity at large into the sphere of education. There are perhaps seventy cases in which no evidence is yet forthcoming of preëxisting schools, but in most of these no expert examination has yet been bestowed on the school or other local records. The salient feature of the Elizabethan foundations or refoundations after the first ten years is the extent to which they were due not to single founders but to joint effort of the lay inhabitants by subscriptions and donations and a sort of informal voluntary rate, as evidenced by the records which have been preserved in such places as Ashbourne, Derbyshire, Halifax, Yorkshire, and St. Olave's School, Southwark. One result of this reliance on popular effort was the attempt to make the schools either only elementary schools or serving the double purpose of secondary and elementary schools by having an usher specially to teach the "petits," English, writing, and accompts. The attempt was not regarded with favor by the authorities, and it is noticeable how when St. Olave's, Southwark, obtained a charter in 1571 for a school which had been maintained as an elementary school since 1560, the charter provided for grammar, though by what is perhaps the first precedent it also provided instruction "in the accidence and other low books and in writing." At Wellingborough, where a grammar school had been maintained out of some gild lands, a suit in chancery resulted in a decree in 1599 authorizing two "distinct" schoolmasters on one foundation; one to teach Latin at 20 marks (£16 13*s.* 4*d.*), the other to teach to write, read, and cast accompts at 20 nobles (£8 6*s.* 8*d.*), with the result of continual friction, the lower master, always the favorite with the town governors, constantly trespassing on the functions and scholars of the higher. The solution of establishing independent elementary schools for the poor and those who did not want Latin only began to be attempted in the last twenty years of Elizabeth's reign.

A. F. L.

See Bible in the Schools; Catechisms; Church Attendance of Scholars; Edward VI; Elizabethan Period. For Scotland, see Calvin; Calvinism in Education; Knox, John; Scotland, Education in.

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REFORMED CHURCH IN AMERICA, BOARD OF EDUCATION OF. — See College Boards in Education, Denominational.

REFORMERS, EDUCATIONAL. — The term commonly applied to the group of educational innovators of the sixteenth and seventeenth centuries who broke away from traditional educational ideas and practice. The term is just as applicable to any educational innovator of any time. It was used by Von Raumer in the middle of the nineteenth century when he wrote the first adequate history of education, with a strong classical and conservative bias, and applied the term to the leaders in realism in education (*q.v.*). It was popularized in England by Quick (*q.v.*), who published in 1868 the most widely used English text in the history of education under the title *Educational Reformers.* For more detailed description of the work of the educational reformers, see Comenius, Ratke, Francke, etc.

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REGENERATION.—See Religion, Psychology of.

REGENTS, BOARD OF. — See Board of Regents; New York, State of.

REGENTS' PARK COLLEGE. — See London, University of.

REGIOMONTANUS, JOHANNES (1436–1476). — The Latinized name of Johann Müller, a German astronomer and mathematician born at Königsberg in Franconia (whence he called himself Joannes de Monte Regio or de Regio Monte; also Kunisperger). At the age of twelve he entered the University of Leipzig and at fifteen became a pupil and friend of Georg Peurbach (1423–1461) at Vienna. Peurbach was invited to Rome by Cardinal Bessarion to prepare an edition of the *Almagest*, but died before he reached Italy. Regiomontanus, however, went to Rome and applied himself assiduously to the study of Greek and copied many Greek manuscripts on mathematics and other subjects. For some time he visited the chief cities of the North of Italy and lectured at Padua in 1464 on Alfraganus, preceded by a valuable introduction on the history of mathematics (the first of its kind). In 1468 he returned to Vienna, but soon left to accept the invitation of the king of Hungary, Matthias Corvinus, to take charge of his library and MSS. at Ofen. In 1471 Regiomontanus settled at Nuremberg, where a wealthy citizen, Bernard Walther, became his pupil and patron, and provided him with an observatory, a laboratory, and a printing press from which many valuable mathematical and astronomical works of the ancient and medieval periods were published. In 1475 Regiomontanus was summoned by Pope Sixtus V to Rome to reform the calendar, but before he could proceed far with this work he died, of the plague or of poison, in 1476.

Most of the writings of Regiomontanus were left with Bernard Walther and were never published or were scattered. Much valuable material is also found in his correspondence. The works which were published are the following: the completion and edition of Peurbach's *Epitome in Cl. Ptolemæi magnam Compositionem* (publ. 1496); an astrology containing astronomical tables and a table of natural tangents (publ. 1490); the *De Triangulis omnimodis*, a work on plane and spherical trigonometry, introducing the sine and cosine (publ. 1533); marginal notes to Adelhard's translation of Euclid; and a number of trigonometrical and astronomical tables (*Tabulæ Directionum*, and *Tabula primi mobilis*). From the printing press at Nuremberg, Regiomontanus issued popular almanacs and the *Ephemerides*, containing astronomical information for a period of thirty years. While the originality of a great deal of Regiomontanus' works has now been disproved, his contributions in his particular field mark the point of transition from the medieval to the modern.

See Renaissance and Education.

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REGISTER. — See Records and Reports.

REGISTRATION. — See College Requirements for Admission; Records and Reports.

REGISTRATION OF TEACHERS. — See Teachers, Registration of.

REID, THOMAS (1710–1796). — The founder of the Scottish school of philosophy, was professor of metaphysics at Aberdeen and then at Glasgow University. This school of thinkers labored to counteract the skepticism of Hume (*q.v.*) and the idealism of Berkeley (*q.v.*), both of which grew out of the representative theory of Descartes (*q.v.*), in which he maintained that what we perceive is not material objects, but their images. In opposition to this view, Reid taught that our perception of external things is immediate. His most distinctive contribution, however, was his *Doctrine of Common Sense*, which he expressed briefly as follows: "All knowledge and all science must be built upon principles that are self-evident; of such principles every man who has common sense is a competent judge. Such intuitive convictions, in both philosophy and ethics, are primary data of human thought." To this dictum Kant replied: "It is one of the subtle devices of our times to appeal to common sense when our knowledge gives out, and the shallowest fool confidently measures his strength with that of the profoundest thinker." Some confusion arose from the fact that in developing his philosophy Reid used the term common sense with two meanings: (1) the faculty of sound judgment, and (2) the sum-total of self-evident truths implanted in the minds of men. In the first sense of the term his argument was weak, but in the second (as set forth by Hamilton) it was strong. The teachings of Reid were developed and propagated by the other leaders of the Scottish school, Stewart, Brown, MacIntosh, and Hamilton. They established themselves in the Scotch universities and profoundly influenced British philosophy and ethics during the nineteenth century. The traditions of the Scottish school were perpetuated by Professors McCosh (*q.v.*) and Porter, and prevailed among the American colleges throughout this period almost as widely as in Great Britain. W. R.

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REINDEER SERVICE. — See ALASKA, EDUCATION IN.

RELAXATION. — See DELSARTE.

RELIGION, PSYCHOLOGY OF. — The application of the methods of modern psychology to the phenomena of religion is a development of the last fifteen years. The subject is yet in its pioneer stage, but certain problems have been well defined and some specific results attained. The development of the psychology of religion thus far may be indicated conveniently in terms of these central problems, the methods employed in their study and the conclusions suggested.

The first subject investigated was conversion. Starbuck, in *The Psychology of Religion;* Coe, in *The Spiritual Life;* and James, in *The Varieties of Religious Experience,* dealt with this awakening of religious consciousness in the individual. Starbuck employed the method of the *questionnaire,* gathering from hundreds of people accounts of personal experience in reply to his list of questions. These records were classified, analyzed, and summarized by means of averages and percentages, with diagrams and interpretations. Professor Coe supplemented the *questionnaire* by the use of experimentation, particularly in reference to the influence of temperament in determining the conversion phenomena. Professor James introduced what may be called the literary and autobiographical method. He selected the accounts of striking phenomena from individuals very diverse in culture and temperament. In this way he enriched the material of the subject and suggested many new directions for further inquiry.

Certain results of this study of conversion and closely related topics have been well established. It has been shown conclusively that conversion is predominantly an adolescent phenomenon. The greatest number of conversions occur about the age of sixteen. The curve for these figures rises to the next highest points at twelve and eighteen. Starbuck emphasized the corresponding physiological and neurological developments in adolescence and also pointed out the close relation between the maturing of the sexual nature and the awakening of the religious life. He showed that conversion occurs at an earlier age by approximately two years in females as compared with males, and that their experience is more emotional, more suggestible, and therefore more susceptible to revivalism. Coe confirmed these results and added important experiments with reference to differences in temperament. By the use of hypnotism and other means he was able to determine that persons who experienced hallucinations, visions, and motor automatisms in religion were subject or susceptible to them in other matters. All students of the subject agree that many persons do not, and are temperamentally not liable to, undergo conversion. They constitute the "once-born" type for whom religion, if it is experienced, is a gradual growth. Some authorities regard this as the more normal type and therefore emphasize this as the process of "salvation by education." The study of conversion naturally raises the question of the place of religion in childhood. The attitude of the child toward the doctrines and rites of religion is of the same character as his attitude toward other intellectual phases and practices of the adult world, — largely external and imitative, but genuine and real within those limitations. As the tendency among psychologists is to discard the notion of religious instincts, there is increased emphasis upon those forms of behavior, built up through association and habit, which are in accord with social customs and ideals. The different periods of childhood, as observed and described by genetic psychology, may therefore be taken as representing the possible stages and forms of the child's religious interest.

Another series of investigations has dealt with the origin and development of religion among primitive people. Here the methods of social psychology (*q.v.*) have been employed. The customs and ceremonials of the less developed tribes have been examined in relation to their moral and religious significance. The rich materials afforded by recent anthropological studies of native peoples give unprecedented opportunity for discovering their inner life. The study of their rites and observances has shown the close connection between these and their occupations and environment. The central interests of religion are the life processes by which individuals are preserved and the race maintained. Among pastoral peoples the flocks and herds are sacred. The first-born are regarded with special respect and are made the occasion of festive rites and honors. Seedtime and harvest are marked by ceremonials performed with some reference to the growth and preservation of the crops. Likewise drouth, pestilence, and other strange, irregular phenomena of nature occasion the performance of ceremonials. The crises of human life are also conspicuous. The events of birth, attaining manhood, marriage, sickness, death, and war are usually marked by tribal rites. The ceremonies are therefore concerned with life and death issues. The various arts of music, decoration, dancing, and pantomime are organic parts of the dramatic representation. The myths and prayers are also integral factors and scarcely exist independently. These ceremonies are regarded as working magical effects. Such customs are fortified by numerous taboos — fears of penalties for neglecting or improperly performing the rites. Religion does not therefore appear among primitive races as something distinct from law, art, and morals. These are undifferentiated. Likewise, it is difficult to discover clearly discriminated notions of gods, spirits, and souls. The answers of savages concerning such matters are vague and inconsistent, probably not so much on account of reticence as because of the absence of clear ideas. They are dominated by habit and custom to a degree almost inconceivable by civilized man. The more fruitful studies of primitive religions are therefore those which deal with objective facts and emotional reactions rather than with a search for concepts and beliefs.

Several special problems have been investigated independently by the methods of individual and social psychology. Ritual, prayer, faith, belief, prophecy, speaking with tongues, mysticism, and other subjects have been treated. Certain general principles of modern psychology have been especially fruitful in these studies. The reaction from the older rational psychology is evident. It is found that many phenomena of religion are to be approached from the standpoint of instinctive and emotional reactions. Perhaps undue importance has been attached at times to the notion of the subconscious as a key to all these subjects, but when employed in the strictly psychological sense, it is a solving conception. It may be used as that form of experience illustrated by well-formed habits which require little conscious supervision. The individual person may be regarded as having different selves according to the different systems of habits which have grown up in his experience. These selves are at times in conflict; or one self appeals to another for aid; or one self seems to command and dominate another as if speaking or appearing in a vision from without. Such a view explains at once certain phenomena of prayer, prophecy, and mystical states.

Another important principle employed by several scholars in the interpretation of these experiences is the essentially social character of consciousness. Attitudes, habits, and forms of action are not original with a given individual nor are they peculiar to him. He gains the structure and content of his intellectual and spiritual world in large part from the social group with which he is most closely identified. Like his language, his view of the world is taken over from his social environment and becomes part of his living experience. The savage learns his language quite unconsciously. He is able to use it, but he is not able to explain it or to interpret its structure. In the same way, his ceremonials and taboos have been wrought out in a vague and awe-inspiring past. "It is our custom," or "it was so in the days of our fathers," is a constant declaration of the social and corporate character of the sacred observances. In more developed stages, also, religion displays this social character. It emphasizes group authority, loyalty to common ideals, and gives its approvals and condemnations in the name of the whole people or body of believers. The mental processes of the individual bear the stamp of their social history. This inner thought is carried on in the form of conversation. His meditations and prayers to the deity are in the forms of social intercourse. Further, the ideals characteristic of the highest religions are the expressions of distinctly social sentiments or instincts, such as sympathy, love, and coöperation.

Certain problems are often identified more or less with religion, concerning which psychology has as yet obtained chiefly negative results. Such are spiritism, telepathy (*q.v.*), and other aspects of occultism. Concerning psychotherapy more definite and positive opinions are held by reputable psychologists, but these are not primarily matters of religion. E. S. A.

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RELIGIOUS EDUCATION. — Education controlled by a religious conception of the aims of human life. In strictness the term implies a differentiation of educational thinking and practice that is distinctly modern. In the beginnings of culture, and for a long period thereafter, there was no conscious separation of religious from other social functions. Tribal consciousness included tribal religion; often national consciousness included national religion. What we now classify as religious ceremonies of early peoples were at the same time economic and political in character. (See Irving King, *The Development of Religion.* New York, 1910. Also E. S. Ames, *The Psychology of Religious Experience.* Boston, 1910.) Accordingly, it often happened that one and the same educational process inducted the youth into both sacred and secular functions. One condition for the differentiation of education into religious and secular is realized whenever an old religion breaks up, or divides, or even encounters strong opposition. Such a condition was present in Greece in the time of Socrates; it is reflected alike in the accusation against him, which combined religion and education, and in Plato's scheme for education that should be primarily political. (See Greece, Education in; Socrates; also Plato.) The elements of the problem are present, indeed, in any period of especially progressive culture. For such progress means, as with Humanism, the self-assertion of some phase of culture on the basis merely of its own freshly experienced value. A contrast with religious education then arises on either of two grounds, — the conservatism of religious institutions and the consequent delay in assimilating the new culture, or the claim of such institutions to represent a supreme, inclusive, and authoritative rule of life.

It remained for the Reformation, however, to introduce a period in which the adjustment of religious and secular ideals is a fundamental and increasingly acute problem for the whole Western world. The Reformation is not to be thought of as chiefly a contest between two conceptions of the Christian religion. It was also and rather a stage in the splitting up of the medieval theocratic state into free religion and a free state. The significance of this political movement for education is profound. Shall the secular state control education which has heretofore been the prerogative of the church? If so, what shall be the content of instruction, and what the vital aim, of schools controlled by the civil power? In general the tendency has been first to reduce or remove ecclesiastical administration of schools, and then to reduce or even eliminate religious instruction. On the other hand, this has awakened in the churches a fresh consciousness of their own educational responsibility, and fresh zeal in devising means for supplying what the modern state does not provide.

The French Revolution conveniently marks the beginning of a struggle to give institutional expression to these divergent educational aims. A glance at the successive education laws of France, England, and the American States reveals an unambiguous tendency to discriminate educational aims more and more sharply, and to withdraw from religious instruction, leaving it more and more to the guidance and finally the support of voluntary religious organizations. (See England, Education in; France, Education in; Bible in the Schools.) Before describing the response of the churches to this situation, it is necessary to specify more in detail the factors that enter into it. (1) The political factor, which has just been described as the breaking up of the medieval theocratic state, includes as one of its prominent features the growth of democracy. This is evidenced in education by the establishment during the nineteenth century of the principle of universal and even compulsory education provided by the state. This implies, at bottom, that education is no longer a boon granted to few or many, but a right, and further that the ideals that shall control it are to be simply the ideals of the people themselves. In principle, what could be farther from the presuppositions of medieval education? For the school is now no longer an instrument whereby an external authority imposes its ideas and ideals upon the people, but rather the consummate expression of the determination of the people to be self-ruled. (2) A second determining factor in the situation is the growth of modern science. Scientific method involves an effort to liberate inquiry from limitations imposed not only by ecclesiastical authority, but also by religious opinion, and even religious hopes and fears. What we now know as "knowledge" or "learning" asserts itself on its own ground, without reference to religion. The large place that it takes in education is therefore not only nonreligious; through this whole area modern education is inevitably antithetical to the "learning" that rested upon dogmatic authority. More than this, it is in contrast to the great basal processes of the mind included under such terms as instinct, emotion, faith, ideals, the "heart." The impersonality, the unemotionality of science fits it in a peculiar way to be material of instruction in the schools of a whole people, especially a people that is religiously disunited. Here, then, as in the political phase of this movement, a conscious differentiation of educational aims becomes inevitable. A simple illustration of the process may be seen in the development of higher education in the United States. Even in the colleges that are under denominational control, most of the organized, officially supported functions have shifted their aim, without any clear definition of policy, from religion to knowledge in the modern or scientific sense. But as a consequence there is now an awakening to the fact of this shifting of aim, and the religious spirit reasserts itself in a demand for specialized methods of religious instruction in these colleges. (3) Inextricably one with the political and the scientific phase of the public school movement is the industrial and economic phase. The age of factory production and mechanical transportation has multiplied occupations and enterprises in which success seems to depend upon mechanical rather than personal and moral forces. Whether one is actuated by economic pressure or by economic ambition, the result is the same; our economic order is not consciously moral as yet, much less religious. The education that it calls for aims to increase efficiency rather than to guide human powers toward any ideal goal. Possibly the movement for industrial, commercial, and technical training will ultimately uncover the spiritual factors in our vocations. Vocational training may yet assist in restoring unity to life. But certainly the first effect of industrialism upon education is just the contrary. Religion sees itself forced more and more to specialize its educational institutions and methods.

The fundamental fact, then, is that two types of social ideal are asserting themselves in education, and in increasing independence of each other. The effort to adjust the two has produced three rather distinct types of educational policy.

(1) The policy of Germany and England, which may be described as state support of religious instruction, but with recognition of sectarian differences. In Germany " religion " is universally included in the program of studies, but Protestant children are instructed in religion by Protestant teachers, Catholic children by Catholic teachers, and Jewish children by Jewish teachers. The English system is complicated by the necessity of adjustment between schools, on the one hand, wholly supported by taxation, and, on the other hand, denominational schools only partly supported thereby. It is further complicated by the fact that state support and control are partly local and partly centralized in the Parliament. The English government first took part in elementary education in 1833. From this time to 1870 its policy was simply to assist schools founded and controlled by voluntary societies or agencies. Religious instruction was given in these schools, but it was not supervised by the state. The education act of 1870 provided for the continuation of grants to such schools, but also for state schools properly so called. In the latter schools religious instruction is given as a matter of course, but no catechism or formulary that is distinctive of any particular denomination is permitted to be used. (See COWPER-TEMPLE CLAUSE.) Further, the " conscience clause " permits any parent to withdraw his child from religious instruction. The education act of 1902 further extends the patronage and control of the state in the voluntary or denominational schools, but it leaves the control of the religious instruction in these schools in the hands of denominational managers. The result is that the state now recognizes and supports two types of religious teaching, the one denominational, the other forbidden to be denominational. Mr. Birrell's unsuccessful education bill of 1906 proposed to put an end to the dual system of elementary schools by withdrawing all recognition and support from schools not provided by a local education authority. But the bill did not propose to do away with state support for religious or even sectarian instruction. (For a summary of English legislation on the subject of religious instruction, see Appendices I and II of *The Religious Question in Public Education* (London, 1911), by Athelstan Riley, Michael E. Sadler, and Cyril Jackson. This book also discusses a dozen different schemes for the settlement of the vexing question.)

(2) The policy of the United States of America. Education is here controlled by the different states rather than by the federal power, but a substantially uniform policy has been pursued. Religious instruction is wholly excluded from the public schools, but no obstacle is put in the way of schools wholly supported and controlled by religious bodies. Any private agency, secular or ecclesiastical, may establish schools attendance at which meets all the requirements of the compulsory attendance laws. The fruit of this policy is the existence side by side of many types of private school, with or without religious instruction. Toward all these schools the attitude of the public authorities is that, in general, of coöperation. The Catholics have established numerous parochial schools which teach the public school subjects and religion besides. From this quarter comes complaint that Catholics are taxed for the support of public schools to which their conscience does not permit them to send their children, and arguments have been made in favor of grants of public money to parochial schools as compensation for teaching the secular subjects. But the policy that is being steadily pursued by the states not only keeps hands off from religious instruction; it also refuses to enter into entangling partnerships with religious denominations. At one point religion still appears in most American schools, namely, the opening exercises of the day, which commonly include the reading of a passage from the Bible without note or comment, and often the Lord's Prayer. In a considerable minority of schools, however, no religious exercises are held, and in some they are forbidden by local authorities. (For full account of American conditions see BIBLE IN THE SCHOOLS.)

(3) The policy of France. Not only is complete separation of Church and State ac-

complished by the Separation Law of 1905, but the Associations Law of 1904 suppresses all schools taught by members of religious orders. Thus the freedom of education that prevails in the United States, and that formerly prevailed in France, is now denied. But this does not prevent religious education given by churches over and above and apart from the day school. On this point the law explicitly protects religion from invasion by forbidding teachers to make objectionable references to any religious faith, and by providing that pupils may be excused from the public school on Thursdays in order to receive religious instruction from their respective churches.

Though it would be an exaggeration to say that stable equilibrium has been reached in either France or the United States, recent events indicate that the English policy and probably the German will have to be modified in one or other of these directions. For, even if a system of state education could successfully extend its wings over conflicting religions or sects, the capacity of the modern state to teach religion is denied not only by Catholics but also by Protestants. How, in short, can the secular state have any religious doctrines or standards? What shall be the religious qualifications of teachers of religion, and who shall test these qualifications? How much and what religion shall be taught by the state? Or, if the state merely patronizes the churches, shall it recognize Christian sects alone, or other religions also? If this policy is once entered upon, are there not qualitative differences among religions that the state is bound to take account of and discriminate between? As a matter of fact, opposition to the teaching of religion directly by the state arises from religionists themselves. It is a matter of common knowledge that German classes in " religion " are often formal, perfunctory, and anything but religious because the teacher lacks religious motive. In England there is opposition to undenominational religious teaching on the ground that, its content being determined by a process of elimination from actual faiths, the instruction is bound to be weak because of its generality, and because of its lack of attachment to any definite religious fellowship.

As the elimination of religious instruction from state schools places the whole burden of it upon voluntary religious organizations, so it places state schools under the necessity of reconstructing their plans for moral instruction and training. This reconstruction is now actively going forward, but it is still in an early, tentative stage. (See MORAL EDUCATION.) The character of the burden to be assumed by the churches depends upon their attitude toward the possibility of moral instruction and training that shall be free from religious control and yet not opposed to religion. If an ecclesiastical body asserts that morals not specifically defined as religious are *ipso facto* antireligious; or if such a body claims for itself exclusive prerogative in the teaching of morals, the logical result is a second educational system, as in the Catholic parochial schools of the United States, which teach both religion and the secular branches. Where such exclusive prerogative is not asserted, there the religious schools, as Protestant and Jewish Sunday schools, leave the secular branches entirely to the state, reserving to themselves only such instruction and training as is religious in a specific sense. In this case religious education conceives itself as coöperating with state education as far as it goes, but as advancing the goal of life beyond the point at which the state must stop. It asks from the state efficient moral instruction and training, which shall be neither antireligious nor antiecclesiastical. The more general ideals of the state schools, as good citizenship, economic efficiency and prosperity, universal good will, and social progress, are always included within the hopes and aspirations of religion as it is known in the western world. A permanent working plan for coördinating secular and religious education is therefore possible wherever the state, though secular, refrains from teaching *secularism*, and leaves the churches free to teach religion in their own way.

The effect of the modern educational situation upon the churches is, on the whole, stimulating; it is at least awakening them to a definite consciousness of educational aims, and to search for correct methods. The doubt whether religion in this age of science and of social reconstruction is sufficiently sure of her own aims to know what she wishes to teach (see John Dewey, Religion and Our Schools, in *Hibbert Journal*, July, 1908, pp. 796–809) is overbalanced on the one hand by considerations of historical continuity. Religion is a part of the cultural heritage of the race to which the child is entitled. (See Nicholas Murray Butler in *The Meaning of Education*. New York, 1908. Lecture I.) The new and untried scheme upon which we are entering is not religious education, but secular schools. Further, there are plentiful signs that the merely naturalistic interpretation of evolution, which would subject man to nature, has not convinced the age. (See J. H. Muirhead, Religion a Necessary Constituent in all Education, in *Hibbert Journal*, January, 1908. pp. 343–358.) On the other hand, direct appreciation of the value of religion carries with it, in a large proportion of the population, readiness to assert the validity of religious education. Indeed, religious thought is focusing upon education as the central means of propagating religion, both within Christendom and in mission lands. (On the missionary aspect of the movement, see *Education in Relation to the Christianiza-*

tion of National Life. The World Missionary Conference Reports. Edinburgh, 1910.) The organization of the Religious Education Association in 1903, and of the Catholic Educational Association in 1904 is symptomatic of a great awakening.

The growth of a distinctly educational consciousness within religion has been peculiarly rapid during the last two decades. Among the leading features of this growth may be mentioned: —

(1) Investigations in the psychology of religion with especial reference to the religious growth of the individual. Typical of this phase of the movement is E. D. Starbuck's *Psychology of Religion* (London, 1899). (2) Efforts to bring instruction in the Bible into line with the assured results of historical and literary criticism. The extensive German literature of this subject is indicated in H. Meltzer's annotated *Verzeichnis empfehlenswerter Bücher und Lehrmittel.* 1. Heft: *Zum evangelischen Religionsunterricht.* 2te Aufl. (Dresden, Bleyl u. Kaemmerer, 1905). An English phase of the movement appears in T. Raymont's *The Use of the Bible in the Education of the Young* (London, 1911). On the movement in America, see references under " Bible " and " Biblical " in the Index to the Publications of the Religious Education Association, in the magazine *Religious Education*, Chicago, April, 1909; and A. J. W. Myers, *The Old Testament in the Sunday Schoool* (New York, 1912). (3) An effort in England and America (most of all in America because of the absence of religious instruction in the state schools) to transform the Sunday school into a genuine school. Notable steps in this direction are the widespread adoption of graded curricula, and the beginning of systematic schemes for training Sunday-school teachers. (See SUNDAY SCHOOL.) (4) Numerous sporadic attempts at special religious teaching, as study courses in the young people's societies of the Protestant churches; courses conducted by Young Men's and Young Women's Christian Associations (*q.v.*); courses for the study of missions; and numerous schemes for the religious training of boys. (5) An effort to improve the teaching of religion in parochial schools. Graded lessons have been prepared, and the formal memorizing of a catechism is being softened by varied means of both impression and expression. See J. A. Burns, *The Catholic School System in the United States* (New York, 1908), and an address by Thomas E. Shields in the *Proceedings* of the Catholic Educational Association, 1908, pp. 199–223 (1651 Main Street, Columbus, Ohio). (See PAROCHIAL SCHOOL SYSTEMS; ROMAN CATHOLIC CHURCH AND EDUCATION.) (6) The organization or strengthening of departments of religious education or of Sunday schools in religious denominations, particularly several of the larger denominations in the United States. See, for example, the two *Reports* of the Joint Commission of the General Convention (Protestant Episcopal) on Sunday-school Instruction, 1907 and 1910. (The 1907 report is printed by G. W. Jacobs, Philadelphia, and the 1910 report by F. H. Townsend, Providence.) (7) The introduction of religious education as a department of instruction in various theological seminaries, and a movement for requiring training in this subject as a qualification for entering the ministry. A considerable number of colleges have also begun to give instruction in this subject with a view, not only to the training of prospective ministers, but also to the preparation of laymen for skilled work in Sunday schools. On this whole movement consult the publications of the Religious Education Association, Chicago. (8) The output of an extraordinary number of books and articles that deal with both the theoretical and the practical aspects of religious education. If much of this material reveals how far religious education must be reconstructed and strengthened if it is to be placed upon a soundly scientific and professional basis, there is here abundant evidence that the work of such reconstruction is being attempted on a large scale.

Method of Instruction. — What, now, are the special problems of method involved in such a reconstruction of religious education? The assumption is often made that, as the principles of teaching are universal, the methods that now prevail in the state schools can be transferred to religion with only such modifications as are sometimes called " special method." It is certainly true that religious instruction is appropriating various features of professional educational practice. These appropriations may be summarized as follows: (1) Modified kindergarten methods with the youngest pupils. Such methods have been advocated for a generation or more, and during recent years they have been so rapidly introduced that they are now regarded as standard, at least in Protestant Sunday schools. This is to be accounted for in part by the religious quality of Froebel's thought, which has influenced the spirit of kindergartners generally. Of course the general lack of professionally trained kindergartners has made possible in most Sunday schools only a distant approach, though a real one, to kindergarten ideals. (2) Special methods of teaching in the grades, particularly methods for the self-expression of pupils. Picture pasting and picture drawing; the making of picture books; notebook work, sometimes illustrated and decorated; map making, both flat and relief, and the dramatization of Bible stories — these illustrate the general trend. Such methods are assumed and definitely planned for in the various systems of graded Sunday-school instruction. (3) Gradation of pupils and of instructional material and method, with improvement in the structure of textbooks and plans of study. This phase of the reform is going on with great rapidity at the present moment.

These adaptations of methods current in state schools are highly significant. It is clear that both formal memoriter methods and hortatory methods are giving way to more intelligent processes. But religious education faces a deeper problem than appears in such adaptations of secular school methods. Shall religion be merely a "subject of instruction" in the same sense as arithmetic, grammar, or earth science? We must surely discriminate between religious education and instruction concerning religion. The aim of religious education is to produce religious men and women. To this end it must guide the growth of moral character, not merely inform the understanding. Besides "knowledge about" religion, there must be appreciation, feeling-attitude, personal ideals, active faith, and efficiency in transforming the world into a "Kingdom of God." Instruction has a necessary place here, but it gets its significance, and it must receive its control, from the larger aim to which it contributes.

The main problem of method, accordingly, concerns the guidance of such personal phases of a child's reactions as sentiments and purposes. It is not enough that the pupil should learn "the things that a Christian ought to know," or in addition become habituated to any given set of acts either of worship or of conduct. Within the Christian religion, at least, though not to the same extent in the non-Christian faiths, the "heart," which means both sentiment and will, is central. At this point the theory of religious education has much in common with the theory of public education. See Moral Education; Sunday Schools.

Now, as the problems of practical life, as far as it is either moral or religious, are social in essence, the chief kind of experience that education has to promote in children is social experience. This does not exclude, but rather includes and subjects to a central principle, guided reactions of the pupil to the impersonal facts and forces of nature. Indeed, the power of impersonal nature to refine, console, and inspire appears itself to depend in major degree upon the attribution to it of something analogous to the companionship that we first know through intercourse with human beings. Because social experience is the material within which religious education works, the family has a position of supreme importance as an educational agency. Through experience of parental affection in regulated relations where love and law are one, the child first acquires ability to conceive and vitally respond to notions of divine love and divine law. The term "Father," by which the Christian religion expresses its thought of and feeling toward God, indicates the psychological basis for Christian education. Starting thus with the experience of social unity in the family, religious growth will naturally take two directions: (1) the religious interpretation and control of the enlarging and increasingly specialized social experience of a direct sort in school and community, and (2) the formation of religious attitudes toward the forces and processes of nature. This is to be accomplished by awakening sympathy for animal and vegetable life conceived under the forms of family experience, gratitude for the gifts of nature, and trust that raises awe and wonder to a social level. To reverse this order by attempting to deduce religious motives from acquaintance with natural facts as such would invert the order of experience of children reared in families, and it would seek to interpret and control the moral-religious life by that whose *prima facie* aspects are least moral and least personal. It follows that the primary educational function of a church is to enlarge the child's social experience in the direction of a present religious fellowship.

This social-experience conception of religious education determines the place and function of religious instruction. Clearly, instruction in religious history, literature, beliefs, and customs should be organized around the pupil's progressive participation in the life of the religious group to which he belongs. Here are to be found the interests that must control the gradation of material; here is found, too, the immediate function that instruction is to fulfill. It must first of all assist the child to a happy adjustment in his own present experience. Not that instruction merely shows what is to be done and how to do it; such narrowness would result in mere habituation, which is only a part of education. Instruction must be more free, more wealthy than this. Indeed, it can perform its primary function of assisting the child to successful adjustment in a present situation only by extending experience, through imagination, into the realm of free ideals. After imaginatively living through the experiences of other persons and other times, analyzing and judging the issues therein involved, the mind comes back to its own problems of present adjustment with fresh power of objective analysis and of appreciation.

Giving the primacy in religious education to active adjustment to the conditions of a present group, life is at once the most ancient and the most recent practice. It is new to us moderns because through most of Christian history a dogmatic-intellectualistic conception has dominated instruction. Neither the content nor the method was determined by analysis of the pupil's present interests and problems, or of his capacity for entering vitally into the activities of the religious communion.

The fixed center about which instruction revolved is a body of logically connected propositions believed to have been committed by divine revelation to the Church, which is authoritatively to hand them down unchanged from generation to generation. This is the historically characteristic presupposition not only of Catholic but also of orthodox Protestant instruction. The presupposed formula has been, "First know, then do." The method appears in its quintessence when instruction is reduced to drilling into the pupil's memory the questions and answers of a catechism. The educational movement, however, among Catholics, Protestants, and Jews, alike, includes a striving after more vital methods. What ultimate relation this striving will have to dogma or to religious authority it is not the province of this article to determine. It is sufficient to point out the problem for religious instruction that is created by the science of education, and to indicate the educational trend within religious circles. We have already defined the problem; it now remains to state the trend. It has at least these features: (1) There is a growing realization that from the truth of dogmas it can by no means be inferred that a child can best be inducted into religion or even into dogma itself by first teaching him the contents of a dogmatic faith. The logical order is no longer assumed to be identical with the educational order. (2) There is increasing recognition of the value of free self-expression on the part of pupils. Provision for such expression is making its way not only on the grounds that general educational science has adduced, but also on grounds drawn from the nature of religion and from observation of the religious reactions of children. Wherever a necessity is felt for reconciling free self-expression with the authority of dogma, the mediating conception is that the same divine thought has been written in both the dogma and the developing needs of a human spirit. (3) Methods of instruction, and in important instances the content also, are being brought into close relation to the pupil's present religious activities. This applies not only to worship, but also to deeds of mercy and help, and to the everyday life of social groups like Sunday schools or Sunday-school classes. Further discussion of this point will be found in the article on SUNDAY SCHOOLS. G. A. C.

See BIBLE IN THE SCHOOLS; CHARACTER; CHURCH SCHOOLS; EDUCATION; MORAL EDUCATION; PAROCHIAL SCHOOL SYSTEM; REFORMATION AND EDUCATION; RELIGION, PSYCHOLOGY OF; ROMAN CATHOLIC CHURCH AND EDUCATION; SUNDAY SCHOOLS.

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See also the References in the body of this article.

RELIGIOUS EDUCATION ASSOCIATION, THE. — Organized at Chicago, Feb. 12, 1903, at a convention of over 400 persons from twenty-three states, two provinces of Canada, and four foreign countries, invited for this purpose by the Senate of the Council of Seventy (a society of biblical teachers). The purpose is "to promote religious and moral education." Membership is open to individuals and institutions without regard to religious affiliations. Investigation, discussion, and promotion of approved standards are carried on by the Council and the following departments: (1) Universities and Colleges, (2) Theological Seminaries, (3) Churches, (4) Pastors, (5) Sunday Schools, (6) Christian Associations, (7) Public Schools, (8) The Home, (9) Schools for Lay Workers. Annual conventions have been held in Chicago (twice), Philadelphia, Boston, Rochester, Washington, Nashville, Providence, St. Louis. The Association maintains a magazine, *Religious Education* (bimonthly), a free library of religious and moral education, a free bureau of information; and it holds numerous conferences. It coöperates with public educators without seeking to introduce religious instruction or worship into the public schools. The membership (1912) is 2636; the annual expenditure, provided by membership fees ($3) and gifts, is $13,860.02. The headquarters are at 332 So. Michigan Ave., Chicago, Ill.

RELIGIOUS EXERCISES. — See BIBLE IN THE SCHOOLS; OPENING EXERCISES; RELIGIOUS EDUCATION.

RELIGIOUS OF JESUS MARY, THE. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

RELIGIOUS OF THE SACRED HEART, THE. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

RELIGIOUS TEACHING ORDERS. — See TEACHING ORDERS OF THE CATHOLIC CHURCH; MINOR RELIGIOUS; also BENEDICTINES; JESUITS; etc.

RENAISSANCE AND EDUCATION. — General Character of the Period and its Educational Significance. — The education of the modern world has its origins in the Renaissance. In this complex movement the revival of learning is the outstanding factor. That, however, was rendered possible by the conditions social, political, and economic of the countries in which it took its rise. As Italy had amongst the European communities attained the highest degree of development in political and social order, in commerce and wealth, in the arts and in the refinement of life, so it was the first to be conscious of the inadequacy of the medieval standards of culture to satisfy its growing needs. By the end of the *Trecento* the finer minds, in Northern Italy at least, were consciously working towards a new standard of knowledge and a wider outlook upon life. It was inevitable that such intellectual unrest should take the shape of a deeper concern for the great historical inheritance of the Italian people.

The Revival of Learning in Italy was in its origin due to a higher patriotism. Petrarch saw himself as the direct heir of the political and intellectual eminence of Imperial Rome. The early idealists of the Renaissance were concerned with the study of the antique as a step towards its reproduction in the modern world. Three great arts lent themselves readily to such revival, language, architecture, and education. Roman building and Roman speech had never ceased to remind Italy of a great past. The revival therefore began with them. But to fit the new generation to enter upon its restored inheritance it was necessary to frame a new education. It was inevitable that the model of such education should be borrowed from Roman antiquity.

The education of the modern world, therefore, took its rise in the determination of the Italian people to understand and to appropriate the spiritual inheritance of the ancient civilization. The instrument elaborated for this end was an education drawn from those same antique sources adjusted to the necessities of a Christian community. Medieval education was primarily technical; it was concerned with preparation for specific careers. The new education had for its aim preparation for life. Humanist and liberal education have ever since been convertible terms. The reconciliation of pagan and Christian ideals in education was in Italy at least reached without difficulty although not without controversy. (*Il Governo di Cura famigliare*, of Dominici, 1405, is a most outspoken protest from the monastic side.) The great schoolmasters in practice found it easy to reach a compromise, just as at a later date did the Reformers and the Jesuits. It was characteristic of the best humanist education that it incorporated what was finest in the courtly training of chivalry (*e.g.* Mantua under Vittorino and the ideal courtier of Castiglione); at the same time the new education was held to be a sound preparation for commerce and for public service.

Petrarch (*q.v.*), although the inspirer of humanism, has no direct connection with the new education. Florence, Padua, and Venice are the three centers in which the revival began to find expression in fresh ideals of instruction. Humanist enthusiasm was strong in Florence in the closing years of the *Trecento.* Nicolò the merchant (1363–1437), Salutati the administrator (1330–1406), and Ambrogio the churchman (1386–1439) stand for the different types of men drawn to the new ideal of learning. Chrysoloras (*q.v.*) was called from Constantinople to lecture at the studio of Florence in 1396, passing thence to Pavia in 1400. This was the first public teaching of Greek in Italy. From his visit may be dated that enthusiasm for the antique learning which peculiarly characterized Florentine society and that zeal for collecting manuscripts and works of classical art which was soon to render the city the first center of humanist study in the peninsula. At Padua, Vergerius was teaching from 1391. He learned Greek from Chrysoloras and popularized Quintilian (*q.v.*). In 1407 Gasparino Barzizza (*q.v.*) (*cuius ductu et auspiciis Cicero amatur et legitur*, says Guarino of him) took the chair of rhetoric where he read the *De Oratore* of Cicero for the first time in Italy. There were Greek schools in Venice. Guarino da Verona (*q.v.*) lived in Constantinople 1403 to 1408 in the house of Chrysoloras. In 1410 he taught Greek at Florence, and in 1412 was elected to the chair which Chrysoloras had vacated twelve years before. In 1414 he opened school at Venice, where he had for colleague a pupil of Barzizza, Vittorino da Feltre (*q.v.*). Meantime the new education had received an exceptional stimulus from the discovery by Poggio at St. Gallen of a complete Quintilian (1417). Five years later the entire text of the *De Oratore* came to light at Lodi. Guarino had already translated Plutarch's tract upon education (1411). In 1423 Aurispa returned from Greece with 238 Mss. Vergerius, perhaps the finest spirit of the early Renaissance, had (about 1402) issued the first sketch of humanist instruction adjusted to modern needs. Between 1420 and 1430 the material for a new educational apparatus was accumulating in the hands of scholars.

The impulse to the new education did not come from the ancient universities of Italy but from the courts and the municipalities. At best the great *Studia Generalia* tolerated representatives of the Revival as subsidiary teachers, for whom comparatively slender remuneration was provided. Bologna, like the University of Paris, lay intrenched within its impenetrable ramparts of vested interests.

The *Studio* at Florence was revived in the last decade of the *Trecento* expressly to further the new learning; there were, therefore, no traditional obstacles to overcome. Out of Guarino's court school at Ferrara developed (1442) the humanist university founded by Leonello d'Este. Pavia gave a welcome to Chrysoloras in the year 1400, but Piero Candido Decembri (*c.* 1440) held his public chair of Greek and Latin at Milan under the patronage of the Visconti. Venice erected Padua into a state university and encouraged the development there of humanist teaching. There was always a large cosmopolitan element amongst the students of Padua, which at the end of the century had become a prominent center of Greek studies in Italy. Marcus Musurus was Greek professor there from 1503 to 1511 when Erasmus attended his lectures. The chief distinction, however, of Padua lies in the place it occupies in the history of Latin scholarship in the period between 1510 and 1550 during which it was the seat of the high Ciceronian cult. It was through the university of Padua that not a few British scholars derived their proficiency in the classical languages. The *Sapienza* in Rome came into prominence under Leo X who designed a Greek college which should make of the Holy City an international center of Greek learning. But at Rome humanism came to an end with the great sack of 1527.

Humanism. — The elaboration of the humanist curriculum in Italy was due primarily to two men, Vittorino da Feltre and Guarino da Verona (*qq.v.*). The school of Vittorino at Mantua (1423–1446) was perhaps the finest example of a great school of the humanities. The scope of his teaching was wider in some respects than that of Guarino at Ferrara (1429–1460). Both of them, like other Italian schoolmasters of the *Quattrocento,* regarded action as the end of education, and the classical authors were employed by them more from the point of view of training for practical life than as subjects of mental discipline or æsthetic satisfaction. The ethical purpose, therefore, was the dominant note in all instruction. This guided the choice of authors to be read, and the stress laid upon their respective values as instruments of teaching. Subjects which did not admit of direct application to life were of secondary interest to the humanist master. Hence mathematics and dialectic were of less importance than the rhetorical moralists, the didactic poets, and the historians. The natural sciences, the lore of animals and plants, as treating of matter vague and uncertain, were ignored except in so far as, like geography, they were necessary to an understanding of poets and historians. Moral teaching was imparted hardly less from the ancient literatures than from Christian doctrine.

The high place accorded to grammar is explained by the fact that the term included not only accidence, syntax, and prosody, but the interpretation of authors. Coupled with rhetoric, therefore, which covered the higher forms of speech, letter writing, oratory, and verse composition, it connoted the full range of classical study up to the point where it impinged upon the knowledge of the philosophy and the law of the ancient world.

The New Curriculum. — The expression *Literæ* is, in the mouth of the humanist, generally equivalent to Latin. Only in exceptional schools and with select pupils did it cover the teaching of Greek. Latin speech, in Italy obviously a less artificial exercise than elsewhere, was cultivated from earliest childhood. It was probably the usual medium of instruction. Grammar, in the narrower sense of the term, taught orally by dictation or learned from crabbed epitomes (*e.g. Regulæ Guarini* or *Donatus Minor*) filled the first years of school. The poets Ovid, Terence, Vergil, provided the first material for reading and recitation. The Italian schoolboy gained marvelous facility in learning by heart. Public recitation by young pupils was insisted upon and great importance attached to enunciation and dramatic gesture in such exercises. It is to be noted that throughout the Revival educators of all types, devout churchmen, rigid Lutherans, and common-sense Englishmen, agreed in affirming the peculiar merits of Terence as an instrument of Latin teaching. The poets to be read after Vergil are Lucan, Horace (*parum minor Vergilio,* according to Æneas Sylvius), Seneca, and Claudian.

The earliest prose writers read were Phædrus, Valerius Maximus, extracts from the *Letters* of Cicero, the *Catiline* of Sallust. But haste was made to attack the masters of oratory. The teacher could not go wrong amongst the speeches of Cicero, of which the four against Catiline were perhaps the most popular. Vittorino used the speeches in Livy. Vegio preferred those inserted in Sallust. At a later stage the *De Oratore* of Cicero and the *Institutio* of Quintilian were carefully studied. Lactantius, the Cicero of the Church, and Jerome were included by many earnest-minded schoolmasters. The reading of Cicero leads up to the practice of declamation as a fine art, and here again notice must be taken of the remarkable memory power shown in learning by heart oratorical prose. All humanists claimed a high place amongst liberal studies for history. Vergerius places it first. But one and all mean by history the literary presentation of the story of ancient Rome, and, to a much less degree, of that of ancient Greece. Nothing that followed the collapse of the Western Empire was worthy of study, nor was any history recognized as suitable apart from its fine literary style. Above all the biographical and ethical aspects of personality and of action constitute the true attractiveness of history in education. Rulers and administrators will undoubtedly acquire wisdom from a study of the experience of the great epochs of Rome and Greece. The soldier may gain insight into the art of war by the study of great campaigns, but as might be expected the humanist had little interest in origins, and is destitute of apparatus of critical inquiry whether upon sources or the growth of institutions. Hence the pupil made his first acquaintance with history through Valerius Maximus, Roman stories from Livy, and, above all, from Plutarch, whose *Lives* were a favorite subject of translation with Latin scholars. Cæsar was not regarded as suitable for beginners; Tacitus is never mentioned; Æneas Sylvius would use the Old Testament and the Books of the Maccabees. History as a whole was regarded as an easy subject in which, as Bruni said, "there is nothing subtle or complex, for it consists in the narration of plain facts which are easily grasped." The same superficiality marks the humanist concept of philosophy. The scholar was instinctively averse to the characteristic learning of the Middle Ages. He refused to recognize the striving for an interpretation of the universe which inspired the great thinkers of the thirteenth and fourteenth centuries. The contempt which they expressed for all learning which did not rest upon the ancient literatures was seldom based upon knowledge. Philosophia to the humanist meant either mathematics (natural philosophy) to which they attached very moderate importance, — *degustasse sat erit*, said Erasmus, — or the commonplaces of morals. Cicero and Seneca provided them with the necessary texts. Virtues and vices were treated solely as matters of personal conduct in its simplest form. They were barely concerned with the ultimate sanction of duty, or with the profound question which intimately affected them, of the opposition between Christian humility and the self-assertion of the man of the ancient world. The method of moral teaching was almost entirely literary and didactic. Plutarch and Livy provided an appropriate body of illustration. In practice, no doubt the best schoolmasters enforced moral teaching by the aid of religion, high example, and loftiness of personality. Public opinion regarded Greek as standing upon a wholly different footing educationally from Latin. The number of masters competent to teach the rudiments of the language was always small. Guarino, Aurispa, and Filelfo (*q.v.*) were the three scholars of Italian origin who had the advantage of learning Greek at first hand by traveling in the East. Vittorino began to study the language when he had well passed thirty, and though a most efficient teacher of what he knew he relied upon two native Greeks, Theodore Gaza (*q.v.*) and Giorgios Trapezuntius, for the higher work of his school. Grammars and texts were naturally difficult to provide. The *Erotemata* of Chrysoloras and the much more complete grammar of Gaza were the only available manuals until the last quarter of the century. The Turkish conquest of the Eastern Empire drove numbers of Greek-speaking refugees to seek their fortune in Italy. Only few of them had any competence as teachers of ancient Greek. The two most profound intellects amongst the exiled Hellenists, Bessarion and Pletho, took no part in education. The more significant names amongst working scholars of Greek origin are, besides the three already mentioned, John and Constantine Lascaris (*q.v.*), Argyropoulus, Chalcondylas. The first and the last of these wrote manuals of grammar which were widely used in the West. Erbano Bolzani of Belluno (1443–1524) traveled for many years in the Greek East. He taught Leo X, as a boy, lectured in Venice, and after writing the best work in grammar of the Greek tongue, spent the ripe years of his life as one of the Greek readers to the press of Aldus Manutius. There is no doubt that both Vittorino and Guarino devoted much time to the teaching of Greek, though probably rather from the point of view of the content of Greek authors than from that of pure scholarship. In 1459 Battista Guarino (*q.v.*), son and later successor to Guarino Veronese, could affirm that without a knowledge of Greek no one was justified in calling himself educated. By the end of the century the high-water mark of interest in Greek studies had in Italy been already passed. The great work of interpreting ancient Greece to the modern world was destined to fall to France. Xenophon, Isocrates, and Plato, and above all Plutarch, were the favorite prose authors in Italian schools. Homer and Hesiod for obvious reasons were preeminent as poets. Demosthenes was curiously less popular in Italy than in humanist schools in Germany. Comparatively slight use was made of the great tragic poets. Thucydides was beyond the capacity of all but scholars of Greek origin. Manuscripts were extremely rare, and every prelection of an author was preceded of necessity by a careful dictation of the text by the reader. It must not be forgotten that Homer was not printed till 1488 or Thucydides before 1499; Æschylus in a mutilated text did not appear till 1518. Such authors were printed in but small editions and were very costly. Regarding composition in Greek we have little evidence concerning school practice, but it was a not uncommon exercise to attempt a version of Latin into Greek oratory. Greek was considered a fitting subject of instruction for girls. Cecilia Gonzaga began it soon after Latin. It was debated whether it might not be learnt before Latin was systematically undertaken. Guarino declined to follow Quintilian in this advice, but he himself at Ferrara turned out pupils who after twelve months' instruction could translate competently from the *Iliad* and the easier prose writers. The humanists of the earlier time were expert teachers by oral methods. Such methods indeed were alone available. In the absence of texts written or printed, the pupil was required to learn both text and commentary by heart as they were dictated from the chair. There was probably more life and spontaneity, less rigor and precision, in the class work of Vittorino or the masters trained under him than was the case during the following four centuries. At hardly any time in the history of modern education has the personality of the teacher counted for so much in the technical work of instruction.

Latin composition, especially in the oratorical and epistolary forms, was the final test of efficient teaching. For both professional and social reasons fluency in Latin speech was highly prized. The Church, the law, medicine, the chancery, international intercourse, made demands which the humanist teachers did their best to satisfy. There was less pedantry of the Ciceronian type in the Latinity of the early revival than there was at Padua or Wittenberg in the following century. It was still possible to believe that Latin might become once more a living language in the practical sense, a language capable of enlargement and adaptation to current needs. Hence the indifference of the professed humanists to vernacular languages, which they, not unreasonably, criticized as unformed, variable, local, jejune in vocabulary, and lacking both in precision as instruments of thought and in elegance as means of literary expression. The dignity of the learned tongue was essential to whatever was worthy of preservation to future ages or had an interest wider than the bounds of nationality. The consciousness of possession of a language peculiar to the select and learned class lay at the root of the inordinate vanity which characterized many scholars of the smaller sort. But it is obvious that with the steady trend of taste and opinion towards the restoration of antique standards in outward life, in art, and in thought, a persistent desire to revive at the same time the antique instrument of expression was not in itself unnatural or pedantic.

General Interest in Education. — Viewed as a whole Italian humanism was fortunate in the men through whom its aims were translated into the forms of instruction needful to prepare a new generation for the vast and bewildering inheritance set before them. With few exceptions the finest minds of the age accepted their leading and sympathized with their ends. To prepare men for service in Church and in State was the highest purpose which the finer humanists set before themselves. In Italy respect for the body and its training scarcely needed to be emphasized, and the contrast between the practice of Vittorino in this regard with that of the ordinary *Stadtschule* of Protestant Germany or of an English provincial town a century later is too striking to be overlooked.

Interest in education was by no means confined to men who were professionally occupied in scholarship and in teaching. Examples of this are most easily drawn from Florence. The bewildering genius of Leo Battista Alberti illuminated education as it did all the other arts. He deals with his subject in the well known dialogue, *La Cura della Famiglia*, in which training is handled from a specifically Florentine standpoint. Matteo Palmieri (1406–1475) was a typical representative of Florentine commerce. Trained under Marsuppini and Ambrogio, he was all his life long closely associated with such powerful families as the Guicciardini and the Capponi. For forty years he was immersed in the public business of his native city. About 1435 he put forth his dialogue, *La Vita Civile*, in which the theme is propounded: In what consist the virtues to be desired in the perfect citizen? In the whole range of pedagogical literature Elyot's *Book of the Governour* alone occupies the rational grounds taken by Palmieri in assessing the right educational ends for the modern state.

Educational Writings and Theories. — Other tractates upon the aim and practice of education which influenced the curriculum and organization of schools in Italy and beyond it may be mentioned: Leonardo Bruni (*q.v.*), *De Studiis et Literis* (*c.* 1429); Francesco Barbaro, *De Liberorum Educatione* from his tract *De Re Uxoria* (1428); Æneas Sylvius (Pius II), *A Letter upon the Right Education of a Prince* (*c.* 1445), and his tract *De Liberorum Educatione* (1450); Battista Guarino, *De Ordine Docendi et Studendi* (1459); Maffeo Vegio, *De Educatione Liberorum* (*c.* 1460); Jacopo Porcia, *De Generosa Liberorum Educatione* (1470); Ivani wrote a letter to his wife on the upbringing of their children (*Del Governo della Famiglia Civile*); Patrizi wrote, before 1494, *De Institutione Reipublicæ* and *De Regno et Regis Institutione* with sections upon teaching. Manetti, Secco Polentone, and Niccolo Perotti wrote similar tracts which are not now discoverable. Perotti was a great scholar, and, as a learned pupil of Vittorino's, his treatise would have been of much interest. Cardinal Jacopo Sadoleto (1477-1547) wrote *De Liberis recte instituendis*, three years after the sack of Rome. He had been a colleague of Battista Guarino at Ferrara and became, with Bembo (*q.v.*), Papal Secretary to Leo X on his election (1512).

Education of Girls and Women. — It has often been asserted that in the education of the Renaissance no distinction was drawn between the instruction provided for boys and girls, respectively. The practice of Vittorino

Vittorino da Feltre (1378–1446).
See p. 737.

Erasmus (1466–1536).
See p. 494, Vol. II.

Michel Eyquem de Montaigne (1533–1592).
See p. 299, Vol. IV.

Thomas Linacre (1460?–1524).
See p. 30, Vol. IV.

A Group of Renaissance Educators.

da Feltre might give color to this opinion. Guarino had as pupils in the classical authors the two daughters of Nogarola. Isabella d'Este, the Duchess Elisabetta of Urbino, and Cassandra Fedele well illustrate the kind of higher culture deemed fitting for women of position. But here again qualification is needed. What was acceptable in Florence, Ferrara, or Urbino as regards the culture suitable to woman, was not accepted in Venice, or in Naples, still less in Palermo. The tract of Leonardo Bruni referred to above is concerned solely with woman's education. It is tentative, and the caution it displays shows that in the first decades of the Quattrocento humanists had to move slowly where the training of girls was concerned. Obviously the nature and extent of a girl's education depended upon the status accorded to women in society. Now only in certain cities, and in certain classes even in such cities, did public opinion admit women to equality of social intercourse with men. In Venice, for example, a woman was hardly seen in public except at church or at formal festivities. Her sphere of action was purely domestic. The standard of the Greek gynæceum commended itself to the patrician merchant rather than the freedom of intercourse which Florentine opinion permitted. Note should be taken of the ideal set out by Castiglione of the training and accomplishments suited to a lady of the Court.

Printing. — The establishment of the first printing press in Italy by two Germans from Mainz in 1465, when the first book printed in Italy was issued from the monastery at Subiaco, is a date of prime significance in the history of Italian education. The press was moved to Rome two years later. In 1469 John of Speier began to issue books from his press at Venice, which thereafter became the most important printing center for the production of the classics. Ferrara, Milan, and Florence had each their press at work in 1471. The cities named were the chief sources whence the stream of classical books spread over Italy and northern Europe. The first Greek book printed in Italy, the *Grammar* of Lascaris, appeared in 1476 at Milan. In 1490 Aldus Manutius framed his project for a Greek press at Venice. From 1493 onwards he issued that great series of Latin and Greek texts which in their smaller forms became models of current classical texts for European printers. It was not until the sixteenth century had dawned that the ancient authors were available to ordinary students. The *Academia* of Aldus at Venice, of which his press was in a sense a department, constituted a veritable university of classical learning to which scholars from all parts of the East and of the West were irresistibly drawn. As the sixteenth century advanced, the center of the printing industry passed northwards to Paris, Lyons, Basel, and Antwerp.

The Renaissance in North Europe. — In the history of human development there is no such phenomenon as a civilization simply borrowed by one people from another. To absorb so complex a thing as an organized system of culture involves of necessity from the outset processes of selection, of adaptation, and of reshaping. When the Revival of Learning, therefore, passed the Alps to establish itself in Germany, France, or England, much more was in question than a mere change of habitat. Humanism in particular affected the Teutonic peoples in ways determined by facts of race and temperament, of history and of social and economic environment. Such variations in the mode of reception of the Italian Renaissance by northern peoples render the study of the spread of the New Learning and the education which was its product an attractive, though highly complex, inquiry. International trade and an universal Church, which alike had their center in Italy, had inevitably resulted in diffusing some knowledge of her new intellectual and artistic interests. Although ambitious scholars, mostly churchmen, were occasionally drawn thereby across the Alps in search of new opportunities of learning, it is in the main true that neither England nor Germany nor France at that time was competent to appreciate or profit by the progress which was characteristic of the Italian states. The contrast presented by the nations of central and western Europe on the one hand and the advanced Italian communities on the other may be realized by comparison of the English life, politics, and literary attainment in the period of the Wars of the Roses (*c.* 1455–1485) with those prevailing in contemporary Florence, under Piero and Lorenzo de' Medici, or with those which marked the zenith of Venetian prosperity and magnificence at the same epoch.

Teutonic Countries. — Nearly every German humanist when he looked back during the sixteenth century upon the beginnings of the new learning in his country, claimed as his forerunner Rudolph Agricola (*q.v.*). Educated at first in the north he studied at Paris, Pavia, and Ferrara, where he imbibed the finest spirit of the Renaissance. He returned to Germany with a desire to spread the great inheritance of antiquity and the new civilization to which it had given birth among his uncouth countrymen (*barbari*, *indocti*, *elingues*, he calls them). Through Dalberg he was able to make Heidelberg a center of humanistic feeling.

It is impossible to lay down generalizations in exact and unqualified terms in treating of so complex a movement as that of the German Renaissance. But certain indications reveal themselves when we pass from a review of Italian humanism to examine the conditions of its development on German soil. The first is that the Revival of Learning in Teutonic lands could make no claim to form part of a great patriotic reconstitution. Classical learning was of necessity a foreign product to the German race. It made, therefore, a different appeal from that which impressed the citizen of Florence or of Rome. The arguments to be put forward for the study of the ancient languages and for an education in which they were the dominant factors necessarily took different shape. It was not difficult to make a case for proficiency in Latin speech and writing in Italian lands, but contempt for the vernacular languages of Germany, France, or Britain was obviously sheer pedantry. The Renaissance, therefore, in northern countries partook little of the national character which belonged to it in Italy. We find Erasmus despising racial distinctions and claiming the New Learning as a potent weapon for destroying barriers of language, religion, and law and, possibly, even government due to instincts of nationality. A republic of learning indeed there might be, but scholars had quickly to realize that in presence of the primitive forces of humanity such a tie was but a feeble artifice.

In the next place the Teutonic stock was, by virtue of its racial type and of its history, more serious in temper, more alive to realities, less readily touched by sensuous emotion, possibly more religious by instinct, than the southern Latins. Humanism in Italy did little or nothing for the reformation of the Church or the permanent raising of moral standards. And this, in spite of certain personalities amongst its adherents of outstanding integrity and devoutness. In Germany, in England, in the Low Countries, and in large parts of France the New Learning was speedily directed to spiritual and moral ends. The element of patriotic emotion, lacking in humanism *per se*, attached itself to the religious and ecclesiastical movement, which was in a very real sense humanism applied to the religious order.

Heidelberg was, after the death of Dalberg, unable to maintain to the full its promise of becoming the accepted seat of humanist studies on the middle Rhine, although Wimpheling (*q.v.*) was Rector there in 1482 and Reuchlin (*q.v.*), whose Greek was good enough to command respect in Rome, was attached to the Court as Councillor to the Electoral Prince. Before 1515 no other German university fared better in retaining as permanent teachers scholars capable of giving a new trend to the curriculum. As in Italy and France, therefore, the university in the main followed rather than led the humanist movement in its early stages. In all three countries the new learning took root in the Court and the school before it vitally affected the university.

It has been usual to regard the Brethren of the Common Life (*q.v.*) as the pioneers of humanism in the Netherlands and western Germany. Alexander Hegius of Deventer was not a member of this order, but his school of St. Lebuin was largely staffed by the Brethren. He was personally favorable to a modified inclusion of classical authors within his school course, and, in particular, he responded to the influence exerted by Rudolph Agricola. Pupils of his, moreover, were powerful forces in preparing the way for a new education during the last decade of the fifteenth and the first two decades of the sixteenth centuries. On the other hand, certain schools under the Brethren were markedly medieval in spirit. At Liège they conducted a foundation which had great popularity, and, as regards organization, was the model of several important reformed schools in western Germany.

It is important to notice that humanism made its way into schools in Germany and the Low Countries by slow and halting steps. With the possible exception of the school at Alkmaar, where Murmellius (1513) was rector, it is impossible to point to a *Stadtschule* or *Domschule* which was avowedly and systematically organized on a humanist basis (*Poetenschule*). The new learning found its way usually into an existing school through an individual master, through a young rector, or, again, through a Governor or patron who had imbibed a taste for letters on his travels in Italy. But with public opinion as yet indifferent, with the Church generally suspicious, with a scarcity of competent teachers, and above all with textbooks and methods of instruction of the traditional type, it was at this early stage well-nigh impossible to recast a school upon avowedly humanist lines. Before 1520, at least, no attempt was made to found a new school, whether under religious, secular, or princely control, which should express the full ideal of classical learning after the fashion which became common in the following decade.

One of the most important figures in the early history of the German Revival is Jacob Wimpheling of Schlettstadt in Alsace (1450-1528), a priest of distinction who approached the task of improving schools primarily as a step towards raising the status and learning of the clergy. He had a remarkable knowledge of Latin authors, although he was ignorant of Greek. He was a student and teacher at Heidelberg (Rector, 1482), where he no doubt knew Agricola. In 1497, whilst at Speyer, he published his first educational tract, *Isidoneus Germanicus*. It is a tentative effort towards establishing a humanist curriculum in which, like most early German scholars of the German Revival, he retains the *Doctrinale* of Alexander de Villa Dei (*q.v.*) as the foundation of grammatical teaching, but associates with it one or other of the little manuals of Barzizza. Christian Latinists, such as Augustine and Prudentius, are intermingled with Augustan writers as texts for study. But though Wimpheling speaks with something less than the serene conviction of Agricola, he ranks next to him as the stimulating force on behalf of humanist study in southwestern Germany. In his *Germania* (1501) he urged the City Council of Strassburg to undertake the foundation of a high school in which the New Learning should have substantial recognition. This appeal was the first step towards the erection of that great school of which Sturm (*q.v.*) was, at a later date, to be the Head Master.

Basel represented the interests of learning in western Switzerland. The house of Froben, the printer, was a center of scholarly society. Schools in which newer methods of instruction were current came into existence between 1500 and 1510. Pirkheimer's influence was probably responsible for tentative steps in the direction of humanist teaching in Nuremberg, where as early as 1485 manuals of Barzizza and epistles of Æneas Sylvius are found side by side with medieval textbooks in the *Spitalschule*. Munich, Ingolstadt, and Regensburg, amongst Bavarian schools, possessed before 1520 occasional masters who endeavored to bring into use humanist methods of instruction. The same is true of Breslau and Goldberg in Silesia.

Rudolph von Langen (1458–1519), who had been a pupil of Hegius at Deventer, spent four years in Italy. As Dean of the cathedral of Münster and Governor of its school, he reorganized the instruction so far as he was able upon humanist lines (1500). Murmellius was appointed by him as assistant master, and with the sympathies of Langen was successful in recasting both the curriculum and the intellectual temper of the entire school. In 1513 he became Rector of the school at Alkmaar, which became a center of humanist education for northern Germany. Murmellius was a prolific writer of textbooks; the *Pappa Puerorum* (1515) was one of the most popular manuals of grammar throughout the next half century; *Scoparius* (1517) was an effective protest against the grammar and logic of the medieval stamp. Emmerich followed in the steps of Münster and Alkmaar. In Cologne, however, under the influence of the university the New Learning found no welcome in the schools.

In central Germany Erfurt was distinguished for its keen intellectual sympathies. Eobanus Hessus (*q.v.*) was master there in 1507; he became presently the head of one of the principal groups of German humanists and enjoyed the intimacy and profound respect of Erasmus. At Freiberg in Saxony, Mosellanus (*q.v.*), a scholar of the first rank, was teaching school in 1515. The *Stadtschule* of Zwickau enjoyed for many years a high repute and had strong humanist leanings. Under Natter (1523) an imposing scheme for a comprehensive classical curriculum was framed, but had little success when put into operation.

Turning to the universities, the career of Petrus Luder, born about 1415, is instructive in respect of their early relations to the New Learning. He spent some years in Italy before the year 1456, when he returned to Heidelberg, where he delivered a remarkable public lecture in praise of the new studies which is believed to be the first humanist appeal made from an academic chair in Germany. Meeting with little response, he passed first to Erfurt, then to Leipzig, spending one year in each, and afterwards to Basel. What is known of him recalls to us the career and temper of Agricola. Keltis or Celtes (1459–1508) is a humanist of a type we are familiar with in Italy, where he had imbibed, as foreigners often did, some of the worst elements of the scholar-adventurer. He lectured at Heidelberg, at Ingolstadt (1496), and at Vienna from 1497 until his death. Through the connections of the Imperial city with Italy, Vienna had been early touched with the spirit of the New Learning. In the year 1493 a standing lectureship on Poetry, that is, Roman literature, was set up. The *Bucolics* and *Æneid* of Vergil were in 1494 prescribed to be read for the degree of Bachelor in Arts. A *Collegium Poetarum* was erected within the university in 1501. But, like similar efforts, it was premature, and four years later had barely a dozen pupils. The first chair in Greek was established there in 1523.

At Cracow as early as 1480–1490 university lectures in the classics can be traced. Keltis appeared on the scene in 1489, but further progress in humanism was suspended, owing to political troubles, until the marriage of King Sigismund with Bona Sforza renewed the Court interest in the New Learning.

German humanism in its formative stage owed most to the universities of Tübingen, Erfurt, Wittenberg, and Leipzig. At Tübingen, Melanchthon (*q.v.*) spent six years (1512–1518) in continuous and profitable study. He was enabled to make himself competent in the text of Vergil, Terence, Cicero, and Livy, and acquired a sound knowledge of Homer and of Demosthenes. He read also Poliziano and other Italian humanist writers. The Greek text of Aristotle was his chief interest, and he found time for mathematics, astronomy, and even for a study of the *Pandects*. Erfurt (where the first book in Greek type printed in Germany appeared in 1501) was the home of the group which produced the *Epistolæ Obscurorum Virorum* (*q.v.*). The dominant figure in its society was Mutianus Rufus, a canon of Gotha, whose correspondence ranks perhaps second only to that of Erasmus in the light which it throws upon the community of learning of the age. Making Reuchlin, Hebraist and Grecian, their hero, the Erfurt humanists engaged in strenuous warfare against the medieval disciplines. Their reckless self-confidence dismayed Erasmus, whose suspicions of the tendencies of Mutianus and his friends were justified in the event, for one and all became militant Reformers under

Luther and Melanchthon. During the first two decades of the sixteenth century the Electors of Saxony led the way in the courtly patronage of letters. Duke George invited various scholars to Leipzig. Æsticampianus (1507) read most of the Latin authors there, including Tacitus. Crocus (1515) and Mosellanus (*q.v.*) held in succession the chair of Greek. The university underwent organic reform in the direction of the subordination of the medieval disciplines to the faculty of letters in the year 1519. Wittenberg at the same period could claim the first rank amongst the humanist universities of Germany. The Electoral Prince in 1518 invited Reuchlin, the *doyen* of German scholars, to find for him a young scholar willing to teach Greek in that university. Melanchthon was promptly appointed to the chair amid the approval of all competent critics. His inaugural address was a manifesto on behalf of university reform throughout the Fatherland. The *Institutiones Grammaticæ Græcæ*, which he issued in the same year, marked an epoch in classical study. Two years later Melanchthon was lecturing upon Greek authors to five hundred pupils. The influence which Luther exercised upon the young scholar was to intensify the patriotic fervor which colored Melanchthon's humanism. That combination of classical enthusiasm with a keen sense of nationality was his qualification for that task which shortly awaited him of organizing afresh the higher education of the German people. Melanchthon supplied to the German Renaissance that which neither Erasmus nor Reuchlin could give; namely, a great constructive capacity. In conjunction with Luther (whose *Appeal for Christian Schools (1524) to the Burgomasters of Germany* was in strict accord with Melanchthon's ideas), he found himself in a position to revolutionize method and instruction in every important town and university where the Reformation held sway. The universities specially affected by his activities were Wittenberg, Tübingen, Marburg, and Königsberg. The great school of Nuremberg organized under his scheme was opened in 1526 by Melanchthon himself amid the enthusiasm of the citizens, who already saw in their city a new Florence. But the *Obere Schule* proved a failure, typical in this respect of not a few imposing foundations in the cities of central and western Europe. For a rigidly classical education covering the life of a boy up to the verge of manhood was found to be in practice an unsuitable training for the son of the average burgher destined for an industrial career. The commerce of the world rested upon vernaculars and not upon elegant Latin. Business aptitudes continued, therefore, to be sought in schools of a different type, or, still more, through experience in office and shop, or in foreign travel. There was undoubtedly a large and steady demand in Teutonic countries for the higher humanist education, but, as the great school of Sturm at Strassburg showed, four careers were in the main open to youth who could complete a full course in letters, — the Protestant ministry, the law, the civil services, and the profession of teacher.

Other schoolmasters who carried forward the work of higher education in Protestant Germany may be represented by the names of Sturm (*q.v.*), Rector at Strassburg from 1536 to 1589, Trotzendorf (*q.v.*), the distinguished Rector of the school at Goldberg (1524), Neander (*q.v.*), the Rector of Ilfeld (1550), and Wolf, the Rector of Augsburg (1557). The first of these built up his school avowedly upon the basis of Melanchthon's principles, *i.e.* its aim was purely humanist in the sense that it prepared its pupils to enter upon the higher study of letters or theology, or law, at one or other of the universities, but gave no technical or professional training within the school course. The religious basis was strongly defined. Like Luther, Trotzendorf attached importance to training in music. The curriculum of Neander was marked by its unusual width. A pupil at Ilfeld might study not only the "histories of all ages," but also the principles of medicine and an interesting range of *Realien*. Wolf was remarkable for the elaborate subdivisions which he introduced in the organization of his classes. He adopted textbooks of French origin, such as Clenard's *Greek Grammar*, abandoning those of Italian scholars as superseded. He revived the practice of disputation (*q.v.*), delivered to his senior pupils public lectures on advanced subjects drawn from history and philosophy, and (differing herein from Sturm) regarded language, whether Greek or Latin, primarily as the means rather than the end of instruction. In the school of Wolf, German humanism as an instrument of education reached perhaps its finest development.

Educational Literature. — The following is a list of certain representative tractates upon education written by German humanists during the period of the Revival of Learning: Rudolph Agricola, *De Formando Studio* (1484); Wimpheling, *Isidoneus Germanicus* (1497); Murmellius, *Scoparius* (1517); Melanchthon, *De Corrigendis Adolescentium Studiis* (1518); Sturm, *De Literarum Ludis recte aperiendis*, (1538); *Nobilitas Literata* (1539); *De Educatione Principis* (1551); Nausea, *De Puero Litteris Instituendo*; Camerarius, *De Ludis Puerorum.*

The Low Countries. — It is unnecessary to draw a sharp geographical distinction between the Low Countries and the Rhinelands of Germany in estimating the influence of the humanist revival. Agricola, Hegius, and Erasmus belong by origin to the former region, but their activities were felt far beyond the country of their birth. So, too, the schools of the Brethren of the Common Life, although founded by a Dutchman, and, in the main, carried on in the Low Countries, had at least as much effect in Germany as in the Netherlands and the Burgundian March. The position of Erasmus (1466–1536) in the world of letters, in so far as it is concerned with humanism and education, is separately treated elsewhere. There is nothing in this significant figure of the Northern Renaissance specially characteristic of the country of his birth; indeed, he expressly disclaims for himself the label of nationality, the barriers of which are in his view one of the chief obstacles to universal peace and the spread of a common learning.

The special service which Erasmus rendered to the cause of humanism in the Low Countries was the share that he took in carrying out the purpose of his friend Jerome Busleiden (1470–1516) to found under his will the *Collegium Trilingue* at Louvain. Busleiden, a friend of Thomas More, had studied Greek at Bologna and Padua before, as canon of Malines, he made that city a meeting point of scholars for western Europe. For fifteen years he was the acknowledged head of humanism in his native country. Louvain at the beginning of the century was more rigidly attached to the medieval disciplines than Cologne itself, partly owing to the strength of vested interests amongst its governing body. Busleiden as a humanist of the finer type was in touch with the progress of the New Learning in every center in which it had taken root. Like Erasmus, he represents the international character of the great *Respublica Literarum.* Hence the new foundation of Colet and of Christ's College, Cambridge, the *Utopia* of Sir Thomas More (1516), stirrings of the new spirit in Wittenberg, Heidelberg, Tübingen, Münster and elsewhere, were so many stimuli to him to devote his wealth to the same cause of learning. Erasmus, although much pressed, was not to be induced to fetter his liberty by the acceptance of the chair of Greek in the new college which by Busleiden's will was set up alongside of the university of Louvain. Adrian Barlandus was the first professor of Latin, Rutger Rescius of Greek, Campensis of Hebrew. Barlandus was a master of spoken Latin and wrote a volume of dialogues which had great vogue in schools. The *Collegium* illustrates the tendency of scholars outside Italy to rank Hebrew with the classical tongues. Clenard, an official teacher of Greek at Louvain, published in 1530 his *Institutiones Græcæ*, the most popular Greek grammar in Europe. But he was also the best Arabic scholar in the West and traveled to Africa to perfect his knowledge. Erasmus' connection with Louvain was strengthened by the intimate relations which he contracted with the great humanist printer and publisher, Thierry Martens, from whose press poured in vast quantities schoolbooks and classical texts which were used in all Western schools, rivaled in this respect by that of Paffraet at Deventer.

Nowhere did the Reformation conflict rage more violently than at Louvain. Erasmus, who made it his home for three or four years between 1518 and 1522, declined to take sides in the quarrel and sought refuge in Basel, and afterwards at Freiburg, returning to the Swiss city shortly before his death (1536).

The Spanish scholar Vives (*q.v.*) was a member of Erasmus' circle in Louvain, where he lectured in both Greek and Latin at the university. He was not affected by the new movement in religion, and his Spanish nationality made him *persona grata* in high society in a country then part of the dominion of the king of Spain. He was called to England by Wolsey (1522), where he enjoyed the patronage of Queen Catherine and lectured at Corpus, Oxford. The latter years of his life were spent at Bruges writing and teaching, and he was much in request as adviser upon learning and schools. The Spanish Netherlands was henceforward identified with the Catholic party and in consequence lost the place hitherto belonging to it in the comity of learning in northern Europe. Many years later the standard of Protestant humanism was firmly planted in the Dutch provinces in the newly founded University of Leyden (*q.v.*), which was for two hundred years the chief center of erudition for Protestant Europe.

France. — The proximity of France to Savoy and to Burgundy, not less than the intimate commercial relations which connected the French lands with Upper Italy, and the further kinship of race and language, rendered the valleys of the Rhone and the Loire more accessible to the spirit of the Revival than those of the Rhine and the Danube. Lyons and Orleans revealed humanist sympathies long before these touched Paris or Toulouse, where the universities held sullenly aloof from a movement which threatened the vested interests of theology, philosophy, and canon law. Stray scholars, like Balbus and Beroaldus (1476–1485), found their way to Paris, but received scant welcome. In reality the Renaissance reached France in the train of the returning armies of Charles VIII and Louis XII. The campaign of Naples (1494–1495) was in truth an originative moment of first importance in the history of the French spirit. The Revival of Letters in France owed to the circumstances of its origin, in part at least, its characteristic association with the court and chateau. Neither Church nor university had a perceptible share in its first stages. The French court at Milan (1498–1512) was the principal channel through which a resistless current of Italian influences poured into France, bearing with it new standards of taste in building, in art, and, above all, in letters. Thus in France as in England humanism looked to the person of the sovereign, the powerful noble, or the great lady for encouragement and material aid in the war against the strongholds of obscurantism. The accession of Francis I (1515) was, like that of Leo X, of Henry VIII, and of Charles V, hailed as the beginning of a new age. The young King was quick, receptive, and had a fine taste; he was ambitious of distinction, and from the outset identified himself with the newborn aspiration for broader intellectual and artistic interests. Guillaume Budé (*q.v.*), the most promising scholar in France, was welcomed at the Court and made royal librarian (1522). Humanists were made secretaries and ambassadors. Erasmus wrote to congratulate his French friends on the prospect before them. Manuscripts and books were diligently collected, the Royal Press set up (1526), and a new *Collège de France* planned on humanist lines and on an imposing scale. When Budé died, in 1540, a modest beginning had been made in the creation of four chairs, those of Latin, Greek, Hebrew, and mathematics.

The religious conflict had hampered the cause of learning in France, as elswehere. The universities in the main held by the old order. Humanism was by them identified, not unfairly, with reform. The next impulse to education came from the great civic corporations in the provinces rather than from the capital. This movement was general throughout France before 1550. The work of the corporation of Bordeaux in the foundation and conduct of the *Collège de Guyenne* in that city is the best representative of a large number of similar experiments. The University of Bordeaux was also governed by the city magistracy. In 1534 this body applied to André Gouvea, a Portuguese scholar, then teaching in the University of Paris, to reorganize the town school on new lines. He brought with him competent Latin teachers from Paris, including Mathurin Cordier (*q.v.*). Under the guidance of a succession of able rectors supported by a broad-minded governing body — Montaigne (*q.v.*) was mayor in 1580 — the college attracted a strong teaching staff, amongst whom were several Scotsmen of note, a Balfour who became Rector, and George Buchanan (*q.v.*). Bordeaux was inclined to neutrality in religion. Gouvea would recognize no difference between Catholic and Reformed amongst the pupils. But very early in its history the governors found themselves bound to conform. Cordier, a convinced follower of Calvin, who had to flee from Paris for refuge to Geneva, joined him there, occupying himself for nearly thirty years in teaching (he was head of the school at Neuchâtel) or in reforming and organizing schools in the Protestant interest. Calvin, as part of his religious activities, governed and controlled the *Collège de la Rive* (1559), the great humanist public school of Geneva, which was a model to other foundations in Huguenot towns. Calvin, however, regarded the college as a seminary for the ministry. It kept up a high standard. Greek was begun at the tenth year of age.

Cordier before he left Bordeaux fixed the methods of organization and instruction for the lower forms of the school upon lines which were not varied for a century. Gouvea was a distinguished rector, energetic, liberal, devoted to his work. *Primus inter pares*, he says of himself in relation to his staff. An assistantship under him was a coveted post, for initiative and originality were certain of recognition. Vinet, his successor, reduced the method and practice of Gouvea to the shape of a written program, which ranks with the most interesting educational documents of French humanism. The program covers both organization (ten forms, followed by two one-year courses in the faculty of arts in the university), methods of instruction, which are worked out in detail for each class, and include disputations, mutual correction, modes of preparation, and the like; and the curriculum, in which Greek takes a place much below that occupied by the same subject in an Elizabethan school of the period. The Latin grammar prescribed was that of Despauterius, as edited by Erasmus, Gaza being set for Greek. It must be admitted that the details recorded of the method of instruction devised for the junior classes impress the present-day reader with a sense of the dullness and laboriousness of the work required. The later history of the college was marked by periods of controversy and depression. The high-water mark of its prosperity was reached between 1556 and 1570, in spite of a threatened cleavage on religious grounds. In 1572 the Jesuits set up a rival college in the city, but this was suppressed under Henri IV, and its revenues fell in part to the *Collège de Guyenne*. The Edict of Nantes (1598) confirmed and extended to the nation that spirit of sincere tolerance which had marked the Bordeaux school since its inception. The wealthy and progressive city of Lyons was in the sixteenth century the natural meeting point of French and Italian culture and commerce and their chief center.

The religious cleavage became definite in 1535. Persecution of Protestant scholars originated in part from the universities. Humanists had sympathized with reform mainly on score of its claim for freedom and its resistance to the authority of traditional learning. But persecution inevitably drove the Huguenots to adopt a new attitude. The rigorously logical mind of Calvin evolved a counter-creed. But scholars drawn to religious revolt in search of a reasonable faith and gentle tolerance, not incompatible with historical continuity, were instantly repelled by a new and unlovely dogmatism. Most of the French scholars declared for the old order. A few, like Étienne Dolet (*q.v.*), a thoroughgoing skeptic, went to the stake. Others endeavored to avoid a perilous declaration of opinion.

Robert Estienne and his son Henri were the first learned printers of Europe, at once scholars and craftsmen. As such they rendered inestimable services to learning. The *Linguæ Latinæ Thesaurus* of the older Estienne, in its edition of 1543, was a monumental dictionary which served as the basis of every great lexicon until the present generation. The Greek *Thesaurus* of his son (1572) was an even greater achievement. The firm was forced to quit Paris for Geneva in 1551, owing to persecution by the Sorbonne. Both father and son thereupon avowed their adhesion to the Reform. It is important to note that Henri Estienne was deeply interested in the right development of the French vocabulary by direct grafting from Greek and Latin. His treatise *La Conformité du langage français avec le Grec* (1565) and his *Dialogues*, in which he satisfies the efforts of the "Italianizers," illustrate the relation of humanism and learning to the vernacular. In this connection, also, the subtle effect of the great activity of translators from Greek and Latin into French in fixing syntactical usage and elaborating sentence forms demands careful attention. The debt due from French and English speech to the scholarly versions from the three ancient tongues is significant of one of the functions which the school study of classics performs for the youth of to-day.

Joseph Scaliger (1540–1609), a pupil of the *Collège de Guyenne*, learned no Greek until he sat under Turnebus at Paris (1559). These two men, with Casaubon (*q.v.*), represent the transfer of supremacy in Greek learning to France. To Scaliger the Italians of the time appeared as pedants, without thoroughness or initiative. Like the Estiennes, he passed for a time to Geneva. His greatest work, which stands outside the range of pure scholarship, was *De emendatione temporum* (1583), a marvelous attempt to determine the chronology of the ancient world. He was called to Leyden in 1593, bringing to it much renown. Fiercely calumniated by the Jesuits, he died in 1609.

In Rabelais and Montaigne (*qq.v.*) we see humanists of another type. Both look upon learning and education as men of the world, both denounce pedantry in all its forms, both are genially tolerant towards everything but intolerance. Rabelais, doubtless, had little but negative influence upon education, for his so-called "realism" was too superficial to form a guide to school practice. Montaigne, on the other hand, stands for the ideal of the scholar-gentleman, who knows the world and moves easily amongst unfamiliar environments. He is the Western equivalent of Castiglione's *Courtier*, adapted to a society which occupies a wider stage. Hence his *Essays* (1579–1580) are amongst the enduring monuments of the humanist spirit. With the issue of the Jesuit *Ratio Studiorum* in its final form (1599) the history of education enters upon a new era.

Spain. — The Spanish Peninsula, in spite of the intimate political and personal relations of the Valencian kingdom with the courts of the Borgia popes and the royal family of Naples, received little impress from the Italian Revival. An occasional traveler carried back a text of Cicero or Quintilian; Salamanca in Arias Barbosa had a pupil of Poliziano as private teacher of Greek rudiments. But the temper of Spanish Catholicism was very serious and never favored "pagan" studies, whilst political and racial struggles hindered learning of all kinds. Antonio of Lebrixa (1444–1522), near Cadiz (Nebressensis) was the first scholar to bring home from Italy an active enthusiasm in the cause of letters. He taught at Salamanca, lecturing on Pomponius Mela and on the Christian Latinists, and also at Alcalá. He published a Latin grammar (1492) and, later, elementary manuals of Greek and Hebrew. The first Latin classic printed in Spain was Sallust (1475). The grammar of Chrysoloras appeared at Madrid, in the finest Greek type ever used in Europe, in 1512. The New Testament in Greek was finished in 1514. Ximenes (1437–1517), Cardinal and statesman, was a firm friend of humanists and made his new college at Alcalá a center of classical learning. Vives was educated at the ancient school of Valencia founded by Jaime I, which was in succession *schola*, *studium*, *gymnasium*, and *academia*, but always essentially medieval in its disciplines, even after its reorganization in 1499. We hear of no humanist school for boys in the Peninsula before those of the Jesuits.

The University of Alcalá attracted both Greek and Hebrew scholars. A Cretan, Demetrios Ducas, taught Greek. Its pupils included Vergara, Alfonso de Nebrija, and Lorenzo Balbo. Erasmus was the rallying name for scholars devoted to the New Learning, and around this hero-worship fierce controversy arose. After the great Italian settlement of 1530, which deeply affected Spain, clerical authority was strong enough to hold humanism "suspect"; scholars began to quit the country. Pedro Nuñez Vela taught at Lausanne, others went to Wittenberg, or to Sturm at Strassburg, where they professed the Reform. The College at Alcalá was in fact a seed bed of "heretics." We hear of scholars in service of Charles V, such as Morillon, a competent Grecian. Buchanan (1544) and Clenard (1532) went to Spain and Portugal, carrying with them possibilities of a new education which fell inert. Until the Jesuits established their influence as the educators of Catholic youth, the classical spirit made no headway in Spanish schools.

Great Britain. — The Revival of Learning in Britain dates from the early years of the fifteenth century, when English ecclesiastics first came into contact with humanist secretaries of the Roman Curia, such as Poggio, Bruni, and Alberti. Poggio himself visited Britain in 1419, to his great discomfort. William Gray went from Balliol to Ferrara to study under Guarino, and returned (1449) with a fine collection of manuscripts, which now rests in the library of his college. The library of Duke Humphrey dates from the same period and was destined to form the nucleus of Bodley's Library. Other scholars such as Selling, mostly churchmen from Oxford, found their way to Italy from time to time during the Wars of the Roses. Italian teachers also began to appear in the same university as peace and order were restored, and endeavored to find pupils in classical Latin, and, possibly, in Greek. Caxton set up his press in 1477.

The death of Richard III marks the close of half a century of unrest and the opening of a new era. In that year (1485) Linacre (*q.v.*) went to Italy to bring back with him not only a sound knowledge of Greek, but a first-hand acquaintance with Aristotle. Another son of Oxford, Grocyn (*q.v.*), after a sojourn in Italian cities, stood up to read Greek in Oxford in 1491. Although he met with slight response, his friend Colet (*q.v.*), returning five years later, drew large audiences to his lectures on Pauline divinity interpreted directly from the texts. It was on Colet's invitation that Erasmus came from Paris in 1499 to spend three months at Oxford, returning for a second visit six years later. Neither university at the beginning of the sixteenth century made official provision for humanist teaching. If given at all, it was a personal and private venture. The first English center of the New Learning was in reality the house of Sir Thomas More (*q.v.*), in Chelsea, where met in 1505 Erasmus, Linacre, Warham, Colet, Fisher, Grocyn, Elyot (*q.v.*), and others — the small group that represented the spirit of humanism in England.

John Colet, on the advice of Erasmus, refounded in 1509 the cathedral school of St. Paul's, on humanist lines indeed, but with a special stress laid upon Christian discipline. St. Paul's is chiefly significant from the fact that its statutes were widely adopted in other foundations, *e.g.* Manchester School and Merchant Taylors', especially in respect of its lay control. Erasmus busied himself in finding masters (William Lily, *q.v.*), and compiling textbooks for the school. The accession of Henry VIII in the year of Colet's foundation was heralded as an event of auspicious omen for the New Learning in England. Erasmus hastened back from Rome in the summer of 1509 to find that nothing very striking was likely to happen. But two years afterwards a lectureship in Greek was created for him at Cambridge, which was his home for four years. It was due to his influence that the first avowedly humanist college in the English universities was founded by his friend and patron, Chancellor Fisher. Christ's College at Cambridge had its counterpart at Oxford in Bishop Fox's foundation of Corpus Christi (1517); in the following year Wolsey set up classical lectureships, and planned his great Cardinal College in the same university. Five years later Luis Vives, one of the finest Latinists in Europe, with a genius for teaching methods and a man of earnest religious temper, was called to lecture in the newly founded College of Bishop Fox.

Meantime the work of Erasmus had borne fruit in other directions. His leisure at Cambridge enabled him to prepare and translate the Greek text of the New Testament, which Froben printed for him at Basel in 1516, along with his edition of Gaza's *Greek Grammar*, which became thereby the standard Greek manual until displaced by those of Melanchthon and Clenard. Sir Thomas Elyot, who as a boy had been brought up in the atmosphere of humanism through frequenting the circle gathered round More, was in a broad sense the true interpreter of Erasmus to England in so far at least as concerned the aims and the instruments of education. *The Governour* (1531) is the finest exposition of the meaning of humanism for the citizen of a modern state produced by the Revival of Learning in Western Europe. Elyot hits the exact truth when he urges that the new political order requires qualified instruments for its administration, and that a trained governing class must henceforth take the place of the privileged caste and the clerk educated under the medieval disciplines. Elyot's *Governour* is the English parallel to Palmieri's *La Vita Civile*, which he knew well.

In spite of religious turmoil which began to vitiate all departments of English life, the New Learning made steady, indeed rapid, progress in English society. In the universities the cause of humanism in the face of fierce opposition was making ground. The foundation of Trinity College, Cambridge, and of the Regius professorships in Civil Law, Hebrew, and Greek (1540) set the seal upon the transition from the medieval to the modern disciplines. Richard Croce, who had taught rudiments at Leipzig, and Thomas Smith had held in succession the Readership in Greek since 1519. John Cheke (*q.v.*) was the first Regius Professor in that language. With Roger Ascham (*q.v.*), Smith, and Cheke in important teaching posts, Cambridge on the eve of the Reformation led the way in English scholarship. Few things in the history of English learning are more difficult than an accurate comprehension of the effects of the Protestant and Roman Catholic administrations of the universities which filled the twenty years preceding the accession of Elizabeth. That political and religious unrest are unfavorable to learning is a law which applied to England in the fifteenth and sixteenth centuries, as elsewhere. Certain facts cannot be overlooked. It was a gain to England that under the Edwardian régime foreign scholars like Bucer were appointed to teach in England. Probably there was advantage to English scholarship in the enforced residence of Protestant ministers and teachers in continental seats of learning in the succeeding reign. On the other hand, humanism became tinged with sectarianism; colleges were partisan societies; at Oxford Magdalen was Protestant and New College Catholic, and there were purgings of one and the other according to political circumstances; medieval books were ruthlessly destroyed by Edwardian visitors at Oxford, where about 1550 a whole library could be bought as waste paper for forty shillings. More serious facts were that matriculations fell off, that graduation was a comparatively rare thing, and that most degrees were taken *in absentia* during the three years ending with 1559.

Yet new colleges and schools continued to be founded: St. John's, humanist but Catholic, and Trinity at Oxford, and Gonville at Cambridge, refounded (1558) by Dr. Caius (*q.v.*), the most distinguished man of science in England, Catholic and humanist. Under Queen Elizabeth national self-confidence returned. The Court from the Queen downwards was imbued with the spirit of the New Learning. Cecil and Leicester were made Chancellors of the two universities, which by degrees became seminaries for the production of a "due supply of fit persons to serve God in Church and State" rather than of scholars of high rank in the comity of learning or theologians of profundity. Their influence upon English society became steadily more marked, and as a result the shrewd advisers of Elizabeth felt it necessary to keep a firm control over their political and religious tendencies. After 1575 political conditions required the exclusion of the Catholic element from English education. Hence the rise of English colleges at Douai and at Rome, following upon the rigorous imposition of tests upon all concerned with instruction. Puritan families mainly affected Cambridge, especially St. John's and the new College of Emmanuel, the avowed center of militant Protestantism, from which so many of the Nonconformist bodies drew their ministers. It was from Emmanuel that John Harvard (*q.v.*) took his degree.

Oxford logic remained strictly Aristotelian; Cambridge, as St. Andrews (*q.v.*), taught it on the lines of Agricola and Peter Ramus (*q.v.*). Greek at both universities steadily declined during the century. Whitgift, the most powerful man of his day at Cambridge, knew no Greek. The Chancellor, Leicester, complained in 1852 that Greek was seldom or never read by its professor at Oxford. No single work in classical scholarship was produced in England which can be compared with that of a hundred industrious classicists in France and Germany. The translators, of whom there were many, unless it were Savile (*q.v.*), worked invariably from a Latin or a French version in handling a Greek author. A few men of multifarious learning like Henry Savile serve to remind us of the broader type of humanism, which was much more common in Italy and France than in Germany or England.

The universities of Edinburgh (1582), Trinity College, Dublin (1591), Glasgow and St. Andrews, were by the end of the century marked by the humanistic spirit. But theology and politics had almost extinguished university teaching in Scotland, whence we find students of Scottish origin scattered throughout seats of learning in Western Europe. George Buchanan, more at home at Bordeaux than at Glasgow, was a classical scholar of the first rank. Gresham College (1596) in London was an attempt to adapt the wider knowledge of the day to the commercial needs of the new time. (See Gresham, Sir Thomas.)

Turning from universities to schools, the latter were of two types: the great public boarding school drawing pupils from the country at large, of which Eton, Winchester, Westminster, and Shrewsbury were the chief, and the town day school, whether new or reformed, such as St. Paul's, Merchant Taylors' (1561), St. Saviour's, Southwark, Tonbridge, and Magdalen College School. The statutes of Wykeham or of Colet were the usual model for a new foundation. Headmasters were rarely men whose scholarship was worthy to rank with that of the great rectors of German or Swiss schools. In the public boarding schools just mentioned, Greek was uniformly taught, though Westminster and Shrewsbury aimed at a higher standard than the rest. Isocrates, Demosthenes, and Homer were taught at one or the other. Clenard's grammar was used until the Eton Greek grammar, based upon that of Grant, began to take shape at the end of the century. In Latin Lily's manual — which became the Eton Latin Grammar — was the dominant textbook throughout the century in both types of school. Much use was made of *Colloquies* (*q.v.*), especially those of Erasmus, Cordier, and Vives. Sturm's *Letters of Cicero* and, though rarely, the *Elegantiæ* of Valla were prescribed. Terence, as usual, was the most popular author. Sallust and Livy came before Cæsar. Composition in prose and verse was the end and purpose of Latin reading. Declamations, essays, and Latin plays were weekly exercises. English writing probably was more cared for than would be inferred from the absence of any reference to it. History and geography signified the history and geography of the ancient world. There is no evidence that either of them was taught on systematic lines. We hear much less of Plutarch in English than in Italian schools. Natural history consisted of uncritical illustrations of the allusions in the classic poets to natural phenomena. Mathematics were gradually eliminated from the curriculum of English grammar schools as they were from the courses in arts in the universities. Much attention was given to singing, whilst writing and ciphering were relegated to inferior schools which confined their teaching to the vernacular. English editors and printers contributed little to the supply of school texts, which were, until the seventeenth century, almost entirely provided by the presses of Plantin and Gryphius, of Stephanus, Martens, and Aldus. It is a significant fact that neither at Oxford nor at Cambridge was the printing press at work between 1530 and 1582. After 1586 license to publish was the privilege of the Archbishop of Canterbury and the Bishop of London. Outside the capital, Oxford and Cambridge alone had authorized printers. (See articles on the separate Public Schools of Eton, Harrow, etc.; Fees; Free Schools; Grammar School; London Schools, etc.)

Certain books call to be mentioned here as concerned with the matter and method of instruction. *The Arte of Rhetorique* by Thomas Wilson (1553), friend and disciple of Cheke, well repays a reading inasmuch as he treats rhetoric from the point of view of English and does not overlook its application to teaching. It contains moreover some thoroughly sound criticism of classical writers and is generally far more solid and practical than similar productions of Italian and French origin. *The Scholemaster* of Roger Ascham (1570) is an appeal for consideration of the defects which he perceives in the humanist education of his time. He writes as a sincere Protestant with a strong national instinct. If young men must travel let them go to Strassburg or Frankfort, not to Italy.

Richard Mulcaster (*q.v.*) wrote two works, *The Positions* and *The Elementarie* (1581–1582), which are the product of his experience as a city schoolmaster. Three points principally demand attention: his advocacy of the training of teachers, his recognition that rigidly humanist instruction is not the preparation which an industrial community demands, and the claim he puts forward for vernacular teaching. The influence of *Il Cortegiano*, as translated by Hoby (1561), in developing an English code of manners is elsewhere dealt with. *The Queene Elizabethes Achademy* of Sir Humphrey Gilbert (1572) presents a scheme of training in which languages, both modern and ancient, mathematics, and law are grouped with technical and military exercises to form an education more in touch than stereotyped humanistic instruction with actual life. It is an anticipation of Milton's generous dream. The works just mentioned along with *The Governour* of Sir Thomas Elyot are one and all marked by a note of reality and of breadth of conception which distinguish them favorably both from the more pedantic tracts of similar purpose of German origin and much of the conventional rhetoric of some Italian writers on educational doctrine.

W. H. W.

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RENDU, AMBROISE-MARIE-MODESTE (1778–1860). — French educator. Although practically admitted to the Ecole Polytechnique, he was forced to withdraw on account of his refusal to take the oath against the royal family that was required by the Directory. He was thus cut off from all academic honors. Fontanes, with whom he early came into contact, was his warm friend and was responsible for his appointment as general inspector under the new Imperial University. From this time on he was ardently devoted to the cause of popular education, and no little credit for the establishment of the first primary normal school in France (Strassburg, 1811) is due to him. In fact there was hardly a phase of public education in which he was not vitally interested and whose conditions he did not strive to ameliorate. He was particularly devoted to the cause of instruction for the working classes, to the extension of the system of primary normal schools, and to the organization of a system of real inspection. Classes for adults, teachers' conferences, schools for girls, and the improvement of teachers' salaries, at one time or another occupied his attention. Throughout it all he was a redoubtable champion of the authority of the state in educational affairs. For nearly fifty years he devoted his life to the educational service of the state as member of the imperial and royal councils of public education, and during this time numerous works issued from his pen. Among the more important of these may be noted: *Quelques observations sur l'ordonnance royale de 1815*; *Essai sur l'instruction publique et particulièrement sur l'instruction primaire*; *l'Université de France et sa jurisdiction disciplinaire*; *Considérations sur les écoles normales* (1839); *Code universitaire.*

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RENNES, UNIVERSITY OF, FRANCE. — A university organized at the time of the general reconstruction of education under Napoleon 1806-1808. The only faculty for many years was that of law. In 1838 a faculty of letters was added, followed two years later by a faculty of science. Medical instruction had been given at Rennes since 1800, when a *Société libre d'Instruction médicale* was established to replace the old colleges of physicians and surgeons which had been suppressed in 1792. In 1820 this school was attached to the University and in 1896 obtained its present title as *École de plein Exercice de Médecine et de Pharmacie.* The enrollment in the University in 1910-1911 was 1573. The *École de plein Exercice de Médecine et de Pharmacie* at Nantes (f. 1460) is generally regarded as a branch of the Academy of Rennes. Its enrollment in 1911 was 347.

See France, Education in.

RENSSELAER POLYTECHNIC INSTITUTE, TROY, N.Y. — See Technical Education; Rensselaer.

RENWICK, JAMES (1790-1863). — College professor and author of science textbooks; was graduated from Columbia College in 1807, and instructor and professor in the college from 1812 to 1863. Author of *Outlines of Natural Philosophy*; *Elements of Mechanics*; *First Principles of Chemistry*; *First Principles of Natural Philosophy*; *Life of DeWitt Clinton*, and numerous scientific papers.

W. S. M.

REPETITION. — See Drill; Formal Discipline; Memory.

REPORT CARDS. — See Records and Reports.

REPORTS, PUBLISHED. — See Records and Reports.

REPORTS, SCHOOL. — See Records and Reports.

REPRESSION. — See Inhibition.

REPRODUCTION LESSON. — See Teaching, Types of.

REPROOF. — See Punishments and Rewards; School Management.

RESEARCH, ENDOWMENT OF. — Scientific research as contrasted with the formal study of organized knowledge is a product of the Renaissance spirit and intellectual interests. This new interest first found organization in the early scientific academies and societies, and here even yet it finds its chief house. With the endowment of these academies and the gifts to them of special funds began the history of endowed research; and such institutions of all countries at the present time provide for research in its widest and most varied forms and render it stable and effective. In fact the encouragement of research is the chief function of such scientific societies. This aspect of the subject is treated under Academies and Scientific Societies. Related to the research work of scientific societies is that done by archæological societies. (See Archæology.)

The second most important form of endowed research, and in Germany from the beginning and the United States at the present time by far more important than the first, is the provision for research by university endowments. This is usually done by means of fellowships or scholarships, and this phase of the subject is treated under these captions as well as in the section on research in the article on American Universities. Fellowships and scholarships do not necessarily indicate an interest in research, as is true with the historical fellowships of the older English universities. In general, in American and English universities the greater part of the research work done is for the purpose of training students. German universities, however, look upon the advancement of the bounds of knowledge through the research work of their professors as one of their chief functions, if not the chief. American and English universities in recent times have come to emphasize this part of their function. The research professor, aside from the English university fellow, is rare. During the last few years, however, some gifts of large funds have been made to American universities for research purposes. Most of these, however, as with the Crocker gift for investigation of cancer, have been for purposes connected with medical education.

During the past century, however, the endowment of research on a new basis has developed. With the rise of the modern scientific spirit, and with the discoveries and inventions of the nineteenth century, the unwisdom and loss in leaving to chance or to subsidiary efforts of men primarily engaged in other matters the exploration and development of new fields of science and social relations, became clearer and clearer to the minds of many benevolent men of wealth. Whole communities or governments also became convinced of the need of promoting systematic and prolonged research. The result is the multiplication of endowments and subventions for this purpose in nearly all of the great nations of the Occident. Many of these endowments are permanent and of royal magnificence; others are in the nature of endowments for a limited period, or for work upon a particular problem whose solution, or whose limitations, at least, are to be determined. Of the latter sort is the gift of $1,000,000 to the Rockefeller Commission for eradication of the hookworm, the sum to be spread over a period of five years. The Crocker endowment for cancer research stipulates that the income may be used for other researches if a method of preventing or successfully treating cancer should be discovered.

It should be noted that certain objections urged against earlier endowments (see ENDOWMENTS, THEORY OF) lose much of their cogency when raised against endowment for research, experimentation, and prolonged observation. Whereas the motive of the earlier givers was usually to educate the youth, to comfort or heal or inspire individuals, or to conserve or extend some form of religion or worship, — in a word, to perpetuate existing organization, method, or stage of development, — the endowment of research is prompted by a desire to expand the bounds of human knowledge, to foster such insight into and understanding of the forces of nature, society, and the human spirit, that mankind generally, rather than the individual or the small and temporary group, shall be variously and cumulatively benefited. The magnitude and outreach of researches relating, for example, to solar energy, to fuel economics, to tuberculosis and venereal diseases, or to social organization and history, all of which are already endowed, are evidences of the constructive and contributive purposes behind the newer endowments for reseach.

These endowments fall into five main groups: (1) pure science; (2) applied science — industry, medicine, etc.; (3) history, politics, archæology, and ethnology; (4) society, including education; and (5) psychology, philosophy, and psychical phenomena. Not all of a particular endowment is necessarily confined to one of these classes, and not uncommonly the research purpose is one of a group of aims suggested to the grantees, to whom the foundation is intrusted; for example, the gift of Sir A. L. Jones of Liverpool, amounting to £500,000, might be used for the industrial education of negroes of the West Coast of Africa or for tropical disease research.

Two methods of endowing research are recognized. The first is the outright gift of a capital sum of money or property, almost invariably by a single giver, or family, or a small group of sympathetic associates, to a specially organized board of trustees or directors, with directions for maintaining a general research in a nominated field or along a prescribed line. The most notable American endowments of this class are the Carnegie Institution of Washington, D.C. (*q.v.*); the Rockefeller Institute (and hospital) for Medical Research, with $8,240,000; the Crocker Endowment for Cancer Research (through Columbia University), with $693,000; the Phipps gift and the Patten endowment, the latter with an income of $10,000 per year, for tuberculosis research; and such great observatories as the Lick Observatory of the University of California ($700,000), and the Yerkes Observatory of the University of Chicago (about $360,000).

In like manner large endowments have been established in Europe. Among these are the Jones bequest, already mentioned; the Prince Roland Bonaparte Fund for scientific research, with an income of more than 25,000 fr.; the Beit Memorial Fellowships for Medical Research, with a capital gift of £215,000; the Sorby Research Fellowship of the Royal Society, with £15,000; and the Radium Institute of London, endowed, in addition to buildings, with £50,000 worth of radium, and similar institutes at Paris, Vienna, and the University of Heidelberg. Closely related to the regular research endowment are those which combine research with other obligations such as instruction, philanthropy, and propaganda. In this class belong the Russell Sage Foundation (*q.v.*), the Carnegie Trust for the Universities of Scotland (£8,000 and upwards of the income from £2,000,000, annually devoted to research); the Carnegie Foundation for the Advancement of Teaching (*q.v.*); and the Nobel Prize endowment of about $9,000,000, for awarding annual prizes of about $40,000 each in five fields, including physics, chemistry, and medicine and physiology. Departments, chairs, and fellowships in large universities in Europe and the United States are frequently so endowed or so administered as to constitute in the total a very large and significant endowment for research.

The second form of endowment is that of the public grant or appropriation of an annual sum by a local, state, or national government, to a regular educational institution or to a special agency, usually for the prosecution of such research as relates to the health, resources, and industries of the political unit. These grants operate precisely as would the income from a capital endowment; they are commonly in the form of a continuing appropriation to an object to which the community is committed by its representatives; they express the desire and will of the organized unit to aid research, just as the bequest or donation expresses the wish of the individual donor. The government votes an annual revenue rather than a capital grant, because the government has a continuing, and not a periodic, existence and power. The revenue thus guaranteed is frequently the equivalent of the income from millions of endowment. In several notable instances private citizens have given great sums to the government for research; for example, James Smithson who in 1826 gave his estate to the United States for "the increase and diffusion of knowledge among men." (See SMITHSONIAN INSTITUTE.)

European governments have long recognized the propriety and advantage of granting subventions for widely variant research enterprises. Some of these have been particular and temporary, like grants of France for scientific research in Morocco or about the South Pole, or like the British grant of £20,000 for Antarctic exploration; others are permanent and general, as the annual grants by Parliament to the British Royal Society (about £20,000) in aid of scientific research and publication, £50,000 from the Development Grant for agricultural research; and the French subventions for like purposes to the *caisse des recherches scientifiques* and to the *observatoire d'astronomie physique* (about 100,000 fr.).

In the United States both the Federal and the State governments are practically committed to large schemes of permanent support of research through annual or biennial appropriations of millions of dollars. In each of the forty-eight States and three Territories are Agricultural Experiment Stations maintained coöperatively by the State and the United States; from the latter each State receives under the Acts of Congress of 1887 and 1906 $30,000 annually. At least one half of the total annual $1,545,000 must be devoted to research, according to plans approved by the Office of Experiment Stations in the Department of Agriculture. The States appropriate about half as much as the Federal Government for these Stations, but probably a smaller proportion goes to research, though certain States have special research agencies, *e.g.* the Institute of Animal Nutrition, of Pennsylvania.

The United States carries on great research enterprises in connection with the work of certain bureaus. Especially noteworthy are the Bureaus of Standards, Chemistry, Plant Industry, Animal Industry, and American Ethnology, and the Public Health Service, for whose support, for administrative and routine purposes as well as for research, annual appropriations of more than $1,500,000 are made.

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See NATIONAL GOVERNMENT AND EDUCATION.

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RESPIRATION. — See BREATHING EXERCISES.

RESPIRATORY DISEASES. — See CROUP; GRIPPE; TUBERCULOSIS.

RESPONSIONS. — The entrance examination or "Smalls" at Oxford University. All candidates must satisfy the examiners in the "stated subjects" which include: arithmetic; elementary algebra (simple equations) *or* the elements of geometry (practically Euclid, Bks. I–III); Greek and Latin grammar; Latin Prose Composition; either unprepared translation from Greek and Latin or translations of passages from prepared books, previously prescribed (covering usually Homer, Euripides, Plato, Xenophon, Cæsar, Cicero, Horace, and Vergil). For those candidates who desire exemption from the classical part of the First Public Examination there is an examination in "Additional Subjects" including: (1) portion of a prescribed Greek or Latin, French, German, or Italian historical or philosophical author; (2) a portion of Bacon's *Novum Organum;* (3) the Elements of Logic, deductive and inductive. A large number of equivalents and exemptions from the Responsions is provided. Special substitutes are allowed for Orientals in place of Greek and Latin.

See OXFORD, UNIVERSITY OF.

RESTAUT, PIERRE (1696–1764). — French grammarian. Destined for holy orders, he later turned his attention to the law, which he entered in 1740. He is best known to the educational world through his *Principes généraux et raisonnés de la grammaire française (avec des observations sur l'orthographie, les accents, la ponctuation, et la prononciation, et un abrégé des règles de la versification française)*, 1730, the first really elementary grammatical treatise in the French language. This embodied many of the ideas of Rollin (*q.v.*) and remained the standard text for three quarters of a century. During his life this went through nine editions, and appeared last at Lyons in 1817. Other well-known and successful books were: *Abrégé de la grammaire française* (1732) and *La vraie méthode pour enseigner à lire* (1759). F. E. F.

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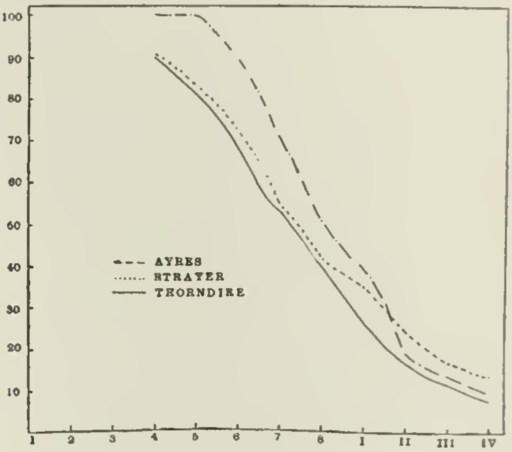
RETARDATION. — A slowess in mental and motor activities; a condition found in many forms of insanity, but in a certain form supposed to be characteristic of the depression stage of manic-depressive insanity. See Circular Insanity; Dementia Precox; Melancholia; Neurasthenia; Psychasthenia; Special Classes. S. I. F.

RETARDATION AND ELIMINATION OF PUPILS. — One measure of the success of a system of free public education is found in the number of years of schooling, or amount of work done by those who attend the schools. In a well-organized school system progress from grade to grade should be regularly achieved by nearly all the pupils, by virtue of the fact that the courses of study and class organization provided place children in groups according to their ability, and give them such instruction as they are capable of mastering during the period assigned for a given grade. That our schools have not achieved this perfection of organization is indicated by the studies which have been made in the field of retardation and elimination.

The most satisfactory data upon which to base a study of either retardation or elimination is a cumulative record of the school history of each pupil involved in the study. Such cumulative records have unfortunately only recently been introduced in our city school systems, and have not been available in sufficient numbers to furnish the data necessary for many of the most significant studies already made in this field. In the absence of these specific data with regard to progress, scholarship, age, and the like, investigations have been made based upon age and grade data from our public school systems. From such a table one can determine, by reading the total of the ages, the age at which children leave school. From three of the more important studies that have been made, the following diagram, indicating elimination, was prepared by the writer, and appears in the *Bulletin* of the United States Bureau of Education.

It will be noted that elimination has become a considerable factor by the time the fourth year of the elementary school course is reached, and that children continue to be eliminated from our schools in large numbers and with remarkable regularity from that time on. By the time the eighth year of the elementary school course is reached, we may expect to find only about 40 per cent of those who entered school seven years previously. In the diagram given below the calculations are based upon estimates of the number beginning, calculated on a different basis for each of the curves. It is significant, however, that the general tendency is found to be the same by each of the separate investigators, the chief difference, which occurs in the grades four to seven, being accounted for by allowances made for retardation by Thorndike and Strayer which do not appear in the Ayres calculations.



Our system of public schools retains most of the children who enter them until they are eleven or twelve years of age. There is a noticeable dropping out, if one reads the tables of ages at eleven years of age. About one half of the pupils have dropped out by the time they are fourteen years of age, and approximately five sixths by the time they are sixteen years of age. If one were to correct the table of ages for the growth of population, death, the transfer of pupils from public to private schools, these estimates of elimination would be slightly decreased. From the standpoint of the amount of education secured by children who attend our schools, it is safe to say that approximately 90 per cent of them have done the work indicated by being found in the fourth grade, 80 per cent of them reached the fifth grade, 70 per cent the sixth grade, 55 per cent the seventh grade, 40 per cent the eighth grade, 35 per cent the first year of high school, 25 per cent the second year of high school, 17 per cent the third year of high school, and 14 per cent the fourth year of high school. Of course these estimates of the amount of education received, or of the age at which children leave school, vary tremendously among the several hundred school systems of the country. There are school systems which keep practically all of their children until they are fourteen years of age, and who retain the majority of them through the high school course. There are other communities which, because of the lack of a compulsory education law, or on account of its inadequate enforcement, show a considerable falling off by the time children are ten years of age, and an extremely small percentage of children beyond the seventh grade of the elementary school course. The figures which are given above are the median figures for the school systems which have been studied; that is, half of the school systems would show a somewhat more favorable condition, while half of them would be distinctly inferior with respect to the length of school life or the grade of work accomplished by the children who attend the schools.

The problem of retardation may be approached either from the standpoint of the age of children in a given grade, or from a consideration of the number of years it has taken these pupils to reach the grade in which they are found. Strictly speaking, a pupil is to be considered retarded only when he has repeated one or more grades of school work. On the other hand, the composition of any grade is apt to consist of children of various ages, the extremes often representing a difference of from four to six years. This feature presents a problem to both the teacher and administrative officer which is none the less difficult by virtue of the fact that some of the over-age children may not have actually repeated in the grades through which they have passed. Defining normal age for the first grade as from six to eight years, for the second grade seven to nine years, for the third grade eight to ten years, and so on, there will be found in any grade a few children who are by this standard below normal age, more who are of normal age for their grades, and a considerable number who are above normal age. Of those who are above normal age there is an occasional child who has entered late, and who has actually made rapid progress in the grades already passed. There are some children who, because of late entrance, appear as over age even though their progress through the school has been normal. By far the majority of children who are over age are those who have actually made slow progress; that is, repeated one or more of the grades through which they have passed. It is safe to assume that 70 per cent, at least, of all of those who are considered retarded on the basis of being over age, are actually retarded if measured by the progress standard. Remembering that the percentage of children over age must be corrected, if we would know the actual amount of retardation as measured by the progress standard, the following percentages, which are the median percentages derived from a study of 319 cities of varying size in all sections of the United States, give some idea of the amount of retardation to be found in our schools.

Population	Percentage of "Over-age" Pupils								Total Percentages		"Under-age" Pupils	
	One Year		Two Years		Three Years		Four Years and over				One Year and more	
	Boys	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*
25,000 and over (133 cities) .	20	18	10	9	5	3	2	1	38	32	4	4
Less than 25,000 (186 cities) .	20	18	11	8	4	3	2	1	38	36	4	5

There are cities which show as little as 8 or 10 per cent of their pupils over age, while at the other extreme are found cities with as many as 70 per cent of all of the children over age. It is interesting to note that in the best cities girls show a smaller percentage over age than boys, and that in the cities making the poorest showing the same tendency is present.

The study of retardation must take account not simply of the amount of repeating or of over age throughout the school, but must also consider the relative difficulty of the grades as measured by the percentage of repetition found in each. Dr. Blan, in his study of the *Incidence of Retardation*, found that of those now in the eighth grade, a larger percentage repeated in the fifth than in the fourth, a larger percentage in the sixth than in the fifth, a larger percentage in the seventh than in the sixth, while in the eighth grade there were fewer repetitions than in the seventh. From this and other data based upon cumulative records of the pupils studied, he argued correctly that the grades from the fourth to the seventh inclusive are increasingly more difficult. The small number of repetitions in the eighth grade is due to the fact that there is a marked tendency to graduate pupils who have once reached the last grade of the elementary school.

In the table given above, the number of children who are under age is also indicated. It is a remarkable fact that regardless of all of our discussion concerning flexible grading, there are comparatively few children who make more than normal progress. A uniform course of study adjusted to meet the needs of the middle group ought to permit as many children to make rapid progress as make slow progress. Such a condition of affairs was actually found in a study made by Dr. Keyes of the *Histories of School Children in a New England City*, in which more than usual attention was paid to the problem of grading and promotion. It has sometimes been argued that since few children make rapid progress, it follows that our courses of study are adjusted to the brighter children. This seems doubtful. In all probability, the reason for a lack of rapid progress upon the part of bright children has been found in the inflexibility of our system of grading and promotion, and in the feeling common among teachers and supervisors that normal progress is entirely satisfactory. Indeed, capable children often pass through the several grades of our schools without ever being put in a position where they are required to do their best work.

Retardation is due to a variety of causes. Illness extending over a long period, moving from one district to another, or from one city to another, backwardness or mental deficiency, the lack of a school course adjusted to the needs of varying abilities, all contribute their quota to the sum total of retardation. Those who are retarded are, of course, more likely to be eliminated than are those who succeed with their school work, so that a lack of adjustment to the needs of children of varying abilities results not simply in repeating, but also in early elimination from our schools.

The study of the problem of elimination and retardation has emphasized the necessity for modifying our curricula. A single curriculum leading from the first grade of the elementary school straight through to the college or university is manifestly not satisfactory. If our schools are to serve the purpose for which they are established, they must take account of the facts of individual differences in interests and in abilities. Classes for those who are backward, mentally deficient, or physically deficient, are already being organized throughout the United States. In New Jersey a recent law provides that all children who are three or more years over age are to be placed in special classes having not more than fifteen pupils. The key to the situation would seem to be found in the organization of courses of study with a minimum of achievement demanded of all, with definite provision for additional work upon the part of those who are of average ability, together with special classes and special schools, especially in the upper grades of the elementary school, for unusually capable children. It has been suggested that the school course beyond the sixth year be divided into three parts, — one division leading to the traditional high school course, another to the high school commercial course, and a third in preparation for industrial or trade education. Whether or not the division comes at the end of the sixth year, it will be necessary at some place in our school course to provide for a differentiation which will make possible a much greater variety of educational opportunity than is at present found in most cities in the United States. The ideal of education in a democracy will be realized when it is possible for each child to work to the maximum of his capacity throughout his school course, and to secure during those years devoted to school capacity that training which will best fit him for his life's work. G. D. S.

See Special Classes; Supernormal Children in the Schools.

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RETENTION. — That phase of the memory process which is involved in holding the earlier experience either in the nervous structure, or in a conscious predisposition ready for revival or recollection and recognition. Retention is a physiological process and undoubtedly depends upon the general property of organic matter, which is described under the term "organic memory" or under the general term "habit." In general, any physiological structure which has been affected by external stimulation, or has performed an act, will be so modified in its structure that at a later stage it will tend to return to the condition into which it was brought through the stimulation or action. C. H. J.

See Memory; Recollection; Recognition.

RETINA. — See Eye; Nervous System.

RETIREMENT OF TEACHERS. — See Pension System for Teachers; Tenure, Permanency of.

REUCHLIN (CAPNIO), JOHANN (1453-1522). — German humanist, born at Pforzheim and there educated. Possessing a good voice, he became attached to the court of the Margrave of Baden, who sent Reuchlin in charge of one of his sons to the University of Paris. Here Reuchlin studied Greek and probably Hebrew. He later went to Basel, continued his Greek studies, and published (1475-1476) a Latin dictionary (*Vocabularius Breviloquus*). Reuchlin accepted the pronunciation of Greek as he learned it from his native Greek teachers and in defense of the so-called Reuchlinian (as opposed to the Erasmian) pronunciation he wrote the *Dialogus de recta Latini Græcique Sermonis Pronuntiatione* (1519). He again returned to France and studied law at Orleans and Poitiers. In 1481 he taught at Tübingen and was recommended as interpreter to Eberhard of Württemberg, with whom he went to Italy and there made the acquaintance of members of the Medicean Academy at Florence. For several years he continued in the service of Eberhard. In 1490 he was again in Italy and met Pico della Mirandola, whose Cabbalistic doctrines he adopted and embodied in the mystical *De Verbo Mirifico* (1494) and *De Arte Cabbalistica* (1517). In 1492 he was sent to the court of Frederick III at Linz, where he studied Hebrew under a Jew, Jacob ben Jehiel Loans, the Emperor's physician. On the death of Eberhard, he was invited in 1496 to Heidelberg by Dalberg and became the center of Greek studies there. In 1498 he was again in Rome and pursued his Hebrew studies. He is next found in the employment of the Suabian League (?1502).

Reuchlin's services to the development of scholarship lie mainly in the introduction and spread of Hebrew as one of the learned tongues, although his contributions in Greek were not inconsiderable. In 1506 he published the *Rudimenta Hebraicæ Linguæ*, a lexicon and grammar to serve as an introduction to the study of the Holy Scriptures. For ten years following his refusal to assist John Pfefferkorn, a converted Jew, in his plan to destroy all Hebrew books but the Old Testament (1509), he was embroiled in controversies with Pfefferkorn and his supporters, the Dominicans and other reactionaries at Cologne and elsewhere. The result of the litigation, through the services of Ulrich von Hutten and Franz von Sickingen, was fortunately favorable to Reuchlin. The whole incident is made noteworthy by the rallying of the leaders in the humanistic movement to the side of Reuchlin and the publication of the *Epistolæ Obscurorum Virorum* (*q.v.*). Reuchlin, like Erasmus, by his appeal to original sources played an important, if involuntary, part in promoting the Reformation.

After the victory over his enemies in 1519, Reuchlin retired for a time from public life, but in the last two years of his life he lectured again at Ingolstadt and Tübingen. To Reuchlin's interest and affection the next generation probably owed the success of his grand-nephew Melanchthon (*q.v.*), whom he advised to study at Wittenberg.

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REUNION. — See French Colonies, Education in.

REUSS AELTERER LINIE, PRINCIPALITY OF, EDUCATION IN. — See German Empire, Education in.

REUSS JÜNGERER LINIE, PRINCIPALITY OF, EDUCATION IN. — See German Empire, Education in.

REVENUE. — See Taxation.

REVERIE. — See Imagination; Memory.

REVERSION. — See Atavism.

REVIEW. — A classroom exercise devised to survey the facts and principles previously learned by observation, discussion, reading, etc., is a review. It is literally a re-viewing of already acquired knowledge in a detailed and completely connected way, so as to relate the items and emphasize the more important of them. It is a summary in which various truths intensively studied are seen as parts of an organized whole, accurately related and well unified. The review may be organized by either of two conspicuous methods: (1) Through the construction of a topical outline which gives a final logical view of the field, or (2) through performing a concrete task involving the knowledge acquired, which gives an arrangement of facts and principles in their practical grouping and sequence. Every review not only gives a new view of ground covered; it tends to test previous acquisitions and to fix important truths and their relationships. H. S.

See Teaching, Types of; Study.

REVIEWS, EDUCATIONAL. — See Educational Journals; Journals and Journalism, Educational.

REVISED CODE. — See England, Education in; Lowe, Robert.

REVIVAL. — See Memory.

REVIVALS OF LEARNING, EARLY. — The arrogation of the term Renaissance (*q.v.*) to the classical awakening of the fifteenth century and the characterization of the Middle as the Dark Ages for a long time tended to obscure the fact that learning and letters flourished in the Middle Ages at different periods, although the characteristics were not always the same. It may almost be set up as a thesis that revivals of learning nearly always coincided with periods of order, and that periods of disorder were inimical to the studies. Such revivals of learning took place early in Ireland (*q.v.*), passed over to England (Northumbria), with Bede (*q.v.*) as its chief representative. To some extent there was a revival under Alfred the Great (*q.v.*). On the continent, of course, the best known period is that of Charlemagne and Alcuin (*qq.v.*), of the latter's disciples, Einhard and Rabanus Maurus (*qq.v.*), and their pupils. From the eleventh century the reform of the monasteries, the revival in architecture (Gothic and Romanesque) and art, the rediscovery of Aristotle, the continued interest in Plato, the study of the seven liberal arts, the great scholastics Aquinas, Albertus Magnus, Roger Bacon, Abélard, the Arabic influences in medicine and philosophy, the activity shown by translators, the patronage of Emperor, kings, and other rulers (Alfonso X, Frederick II, Charles of Anjou, etc.), the rise of the universities, the growing wealth of Italian cities, the architecture and art of the period, the work of Dante and Petrarch, — all these are connecting links between the so-called Dark Ages and the Renaissance. Intellectual activity was continuous; a difference of emphasis of content and outlook mark the distinction between the early revivals and the Renaissance.

REYHER, ANDREAS (1601-1673). — A German schoolman, was born at Heinrichs, a village in the county of Henneberg, Franconia, and studied at the University of Leipzig, where he received the master's degree. He was rector of the gymnasium in Schleusingen, then of that of Lüneburg, and finally, from 1642 until his death, rector of the gymnasium of Sachsen-Gotha, under the duke Ernst the Pious (*q.v.*). By his direction he issued the famous Gotha *Schulmethodus* (1642), a most remarkable course of study for elementary schools, based on the principles of Comenius and Ratke (*qq.v.*). Instruction in the elementary schools was to include not only religion, reading, writing, arithmetic, and singing, but also the "knowledge of some useful things," by which was meant acquaintance with natural phenomena, plants, and animals, as well as some home geography, mensuration, and even elementary civics. Reyher is the author of a number of textbooks on grammar, logic, and rhetoric; his Latin and German *Thesaurus* went through several editions, the last one dating as late as 1733. F. M.

See Gotha, School Reform in.

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Jöcher's *Allgemeines Gelehrten Lexicon.*
See also the References under Ernst I, the Pious.

REYNER, EDWARD (1600-1668). — Puritan minister, vicar of St. Peter at Arches in Lincoln for nearly forty years, and writer on 'human learning'; born at Morley, near Leeds. In 1644 he wrote his *Precepts for Christian Practice*, a work which, amongst other things, lays down the mutual duties of parents and children. But Reyner's chief work from an educational point of view is concerned with the controversy concerning the relation of learning to spiritual development and influence. This book is entitled: *A Treatise on the Necessity of Human Learning for a Gospel Preacher*, showing the benefits of learning in all ages, and showing the influence of Francis Bacon and of J. H. Alsted. Reyner, who was a strong Parliamentarian in the Great Civil War, was driven away from his living (1643-1648). He was one of those ejected in 1662. F. W.

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REYNOLDS, JOHN STUCKEY. — See Home and Colonial School Society.

RHETOR. — See Rhetoric; Roman Education.

RHETORIC. — **Definition.** — Rhetoric is the theory of composition (*q.v.*). These two terms, rhetoric and composition, and their equivalents in several other languages, have become synonyms; for few teachers have ever concerned themselves with the theory except in some immediate connection with the practice, and the practice of even children in school has always demanded some guidance from theory. Such elementary theory, as well as the practice, is often in modern English usage called composition; but the term rhetoric has persisted. Indeed, it is valuable for precision. Composition being equally applicable to all the fine arts, the useful art of composition in words has through many generations been distinguished as rhetoric.

The further distinction between the useful art of words and the fine art, or literary art, is expressed in a separate Greek term for the latter, poetic, or, as we commonly say to-day, poetics. The boundary between rhetoric and poetic being vague, the former has of old invaded the territory of the latter and even made large annexations. Nevertheless the distinction is important. There is in fact an art of words for the common uses of address, and a further and higher art of words for the special uses of individual expression. Either may help the other; both may be included in the survey of certain courses or manuals; but the failure to distinguish the scope of the former from that of the latter has more than once confused the pedagogical application of rhetoric.

The ancients meant by rhetoric, not always exclusively, but always mainly, the useful art. It is obvious from the very etymology of the word that they meant the art of speaking; it is not so obvious, nor is it always remembered, that they meant the art of public address, of speech for the practical purposes of persuasion. Oral address with them was the more practical, as it still is to-day, though no longer to the same extent; written address with them was not common enough to be so generally practical. Except for literary purposes, writing was so unusual as to demand no further discussion in its general aspects than could be included in the doctrine of oral address. To-day, when nearly everybody writes, it is easy both to restrict unduly the pedagogical use of oral composition and to misunderstand the significance of the ancient term rhetoric. By rhetoric the ancients did, indeed, mean oratory; they meant the art of oral address; but they taught as rhetoric more than we now usually mean by oratory. Their idea in the teaching of rhetoric was to inculcate habits of public effectiveness, of persuasiveness on a platform, indeed, but also of the moving of men in all communal affairs. For this reason, and not merely because they included description and narration in poetics, they generally restricted rhetoric to the forms of exposition and argument. Thus focused, rhetoric filled at once a distinct and a large place in the ancient scheme of education; and, thus focused, it has held its place through the centuries.

Aristotle. — The early history of rhetoric survives in the mere names of Corax and Tisias, in faint echoes of the doctrines of Gorgias and Thrasymachus, in the traditions and occasional precepts of the Attic orators, especially Isocrates, and in certain passages of the dialogues of Plato. Though this early history is worth special study, rhetoric for the general concerns of education begins properly with Aristotle (*q.v.*). His *Rhetoric* is complete, not only as surveying the whole scope, but as determining the scope in relation to the other main directions of education. Thus the first great treatise has been an almost continuous educational force, both because of its philosophic finality and because of its pedagogical intent. Quite as important in the history of education as the *Elements* of Euclid, it gave rhetoric a pedagogical significance which still constitutes a standard. The essential lines of this wonderful book are as follows: —

Book I *surveys by definition and division the opportunity of the public speaker.* (i) Rhetoric is the complement of logic (dialectic). It is the art of persuasion formulated by investigating the methods of successful address; and its object is to promote a habit of discerning what in any given case is essentially persuasive. Proof as contemplated by rhetoric proceeds by such means as may be used in public address. Instead of the syllogism, which is proper to abstract logic, rhetoric typically uses the enthymeme, that approximate syllogism which is proper and necessary to the actual concrete discussion of public questions. Thus rhetoric serves as a general public means (1) of maintaining truth and justice against falsehood and wrong, (2) of advancing public discussion where absolute proof is impossible, (3) of cultivating the habit of seeing both sides and of exposing sophistries and fallacies, and (4) of self-defense. (ii) The means of persuasion outside of rhetoric (πίστεις ἄτεχνοι) are witnesses, documents, and other evidence; the means within the art of rhetoric (ἔντεχνοι) are the moral force of the speaker, his adaptation to the disposition of the audience, and his arguments. (iii) The three fields of rhetoric are: (1) deliberative address to a popular assembly, discussing the expediency of a proposal for the future; (2) forensic address to a court, discussing the justice of a deed in the past; and (3) panegyric, commemorating the significance of a present occasion. The eleven remaining chapters of this book analyze each of these fields in its main aspects, or fundamental topics; *e.g.* wealth, happiness, government, crime, virtue, etc.

Book II *studies the audience.* Resuming the general idea of rhetoric as the moving of persons by a person, *i.e.* as dealing with human nature, Aristotle proceeds to examine in ten chapters the common human emotions: anger, love, fear, shame, benevolence, compassion, envy, emulation, and their opposites, analyzing each of these by definition and by its ordinary objects and occasions. The relation of these to the formation of character leads to six chapters on character in youth, in age, in the prime of life, and on the typical dominant traits of character seen respectively in persons of social rank, of wealth, of power, and of good fortune. (The classification here will be more satisfying as psychology if we remember that it analyzes the common types of character and emotion in a crowd. Aristotle is attempting neither an analysis of mental operations nor a science of human nature, but such a practical classification as may inculcate the habit of adaptation to the feelings of an audience. It is significant that he discusses appeal to feeling before appeal to reason, and that he discusses the latter in relation to the audience before discussing it in relation to the subject matter.) After recapitulation at this point, the book adds seven chapters on the common aspects for preliminary analysis of a subject and the common methods of argument. The argument of actual public address, *i.e.* rhetoric as distinct from logic, if inductive, is example, whether imperfect induction or analogy; if deductive, it is enthymeme, whether maxim, precedent, logical exclusion or *reductio ad absurdum.* Remarking the popularity of the refutative, or destructive enthymeme over the constructive, and touching two common fallacies, the book concludes with analysis of refutation.

Book III *studies the speech itself.* Book I having presented rhetoric from the view of the speaker, and Book II from the view of the audience, Book III now applies it directly to the speech. Style, the art of saying things, includes (1) proof as the sources of persuasiveness in the facts, (2) arrangement and expression, and (3) delivery. Study of the last is urged, but is dismissed summarily in (i) as consisting of (*a*) the handling of the voice, (*b*) stress and inflection, (*c*) rhythm. Nor is (1) elaborated. Most of the book discusses (2). Expression, diction, or phrase is analyzed (ii-xii) as follows: ii-iv, perspicuity and propriety, figures and ornament in prose; v, purity; vi, dignity, or amplitude; vii, aptness as emotional and moral appropriateness; viii, rhythm in general; ix, the two typical measures of sentence structure, "loose" and periodic; x-xi, force or vivacity, through figures and through descriptive method; xii, aptness as appropriateness to the kind of speech, descriptive, controversial, popular, or forensic. Arrangement, or order, considers first (xiii) that every speech consists essentially of exposition, or the statement of facts, and proof, or persuasion; but formally a speech may be considered (xiv-xix) as to its introduction (exordium), exposition, proof, and peroration. (For detailed analysis of all three books see Welldon's *Translation*, London and New York, 1886, pp. ix-xlvii.)

Cicero.— There is a gap in the history of rhetoric from Aristotle to Cicero. For authors the intervening centuries show only a few uncertain ascriptions. Nevertheless the common stock of rhetorical tradition used by Cicero shows certain additions. Thus it had become commonplace that the exordium should win the audience to sympathy, attention, and an open mind, that the exposition should be brief, lucid, and plausible, and so on for the other parts of a speech. Aristotle's analysis of sentence structure had been carried into smaller details. His enumeration of figures of speech (*lumina orationis*) had also (unhappy precedent!) been extended and elaborated. Even humor had been analyzed as a means of persuasion. More important is the accepted division of rhetoric into five parts: (1) εὕρεσις (*inventio*), the gathering and developing of material ; (2) τάξις (*dispositio*, *collocatio*), arrangement, order, or composition in the large; (3) λέξις (*elocutio*) style in the ordinary restricted sense, *i.e.* diction and sentence structure; (4) μνήμη (*memoria*), memory; (5) ὑπόκρισις (*actio*, *pronuntiatio*), delivery. This division, though partly implicit in Aristotle, had been developed and fixed since his time, and it has persisted, though with much shifting of emphasis, down to ours. Significant for those modern teachers who deal almost exclusively with the second and third of these divisions is the space devoted by most ancient writers to the first. Rhetoric held its place in the ancient scheme of education partly because it systematically inculcated habits of approaching a subject, of questioning it from all sides, and of thinking it through. In this aspect also rhetoric was the complement of logic and became what Bacon later declared logic to be, the *organon*, or instrument, of the sciences.

Besides many incidental references, Cicero (*q.v.*) left seven works dealing mainly or entirely with rhetoric: *De Inventione* (about 86 B.C.), *De Oratore* (55 B.C.), *Partitiones Oratoriæ* (about 54 B.C.), *Brutus* (46 B.C.), *Orator* (46 B.C.), *De Optimo Genere Oratorum* (about 46 B.C.), *Topica* (44 B.C.). Of these the most explicit and suggestive are the *De Oratore* and the *Orator*. Though neither is a systematic treatise — Cicero is at great pains to disclaim the methods of the *scriptores artium* — both discuss at length principles of composition and details of style. His very definition of the orator as one who will handle any topic with foresight, order, charm, sureness of memory, and a certain dignity of delivery (I. 64), enumerates all five parts of the common division noted above.

De Oratore, surely one of the pleasantest discussions of rhetoric, is a dialogue not unworthy of its Platonic model. The protagonists are the famous orators Crassus and Antonius, with Scævola, Cotta, Catulus, and Sulpicius as minor interlocutors. In Book I Crassus maintains that the true orator commands the whole range of knowledge; Antony, that he commands rather the whole range of forensic expression. The former presents the Academic theory, which Cicero explicitly approves elsewhere, that rhetoric should be regarded as a branch of philosophy. Of his arguments for this theory, Cicero is himself a shining refutation. As a philosopher he is sometimes feeble and almost always derivative; as an artist he is brilliantly effective. So sure was his mastery of expression that even maxims of rhetoric received at his hands a distinction of style which gave them a permanent Ciceronian stamp.

Book II, after trying to show that oratory has only two fields, and accepting the division of a speech into five parts, urges imitation as the first counsel of study. The following treatment of *inventio* groups the common topics for analysis of a case under a few leading questions so memorable as to constitute at least an original revision of the pedagogy of rhetoric, if not an original contribution. Cicero argues eloquently that the current division of cases into those that are general or abstract (*infinitæ*) and those that are specific (*finitæ*) is a capital error; for every particular case must be related to general principles. If oratory is to be more than an accumulation of facts, it must have the habit of such reference. This contention, to which he reverts again and again, is of the very essence of rhetoric, which is the art of bringing things home, of finding the means of persuasion in the fundamental concerns of humanity. As to the other aspects of *inventio* he is less suggestive, and as to *dispositio* and *memoria*, quite summary. Book III, after iterating at length that rhetoric belongs with philosophy, gives a rather thin treatment of the remaining divisions, style and delivery. Most of the practical value of *De Oratore* is in Book II under *inventio*. Cicero's *Orator* professes to present the ideal orator. Though ostensibly critical, it contains a good deal of definite precept, especially Cicero's amplest discussion of style. The introduction transmits a division, which has been ascribed to Theophrastus, of oratory into three styles: (1) *genus grande*, (2) *genus medium*, (3) *genus tenue*. If not futile, this division has become practically vicious in its later interpretations. (It has survived in France, at least, down to our own day.) The best that can be said for it is that in Cicero's hands it is applied to the three tasks, or objects, of oratory: to prove (*genus tenue*), to please (*genus medium*), and to move (*genus grande*). Doubtless, the perfect orator, as Cicero says, should be master of all three; but that is hardly warrant for a division into three styles; nor is this warranted in Aristotle. Discussing *inventio* and *dispositio* summarily as matters rather of general intelligence than of eloquence, Cicero devotes about three fourths of his space to *elocutio*, or style, as the very mark of the orator. Distinguishing prose style from poetic, Cicero discusses what is apt to each of the three prose styles noted above. As to figures he is summary, ampler as to harmony in general, and most ample and systematic as to prose rhythms.

Though Cicero was a great master of style, and at least an important critic of style, his contribution to the theory of rhetoric goes little beyond the sharpening of old precepts and the re-defining and newly relating of matters of diction. Composition in the stricter sense receives less of his attention. He is always primarily the artist of phrase and cadence.

Dionysius of Halicarnassus, writing his treatise on the *Composition of Words* (Περὶ συνθέσεως ὀνομάτων, *De compositione verborum*) in Greek at Rome a generation later (20–10 B.C.), though he declares his intention of instructing practically for political oratory, draws his examples mainly from literature. For the limitation of his treatment of *elocutio* he offers the doubtful pedagogical reason that, whereas *inventio* demands some maturity of judgment, " the love of literary beauty flourishes naturally in the days of youth; " and throughout he implies effectively the sound pedagogical principle that rhetoric promotes appreciation through imitation.

His division is noteworthy as being, not analytic, but synthetic; *i.e.* he divides composition into its processes: (1) the choice of expressions that will combine well, (2) the scheme, or order of parts, (3) revision for adjustment. Thus frankly assuming the attitude of the artist, he proceeds to discuss the four means to beauty of composition: (1) euphony, (2) rhythm, (3) variety, (4) aptness. His division of composition into three modes, severe (*αὐστηρά*), smooth (*γλαφυρά*), and blended (*εὐκρατός*), differs from the threefold division adopted by Cicero (and by Dionysius himself in his essay on Demosthenes), both in point of view and of giving even greater consideration to rhythm. Rhythm, always a main consideration with Dionysius, is discussed finally in the relations of prose to verse. Instinct with literary feeling and charming in style, the book is more suggestive for appreciation than for practical discipline.

Quintilian (late first century A.D.), on the other hand, is laboriously practical. His *Teaching of Rhetoric* (*De Institutione Oratoria*), so minute and diffuse as to extend about four times the length of Aristotle's *Rhetoric*, includes the whole education of an orator. Thus, Book I deals with the early education of boys in speech; Book II, in specific detail, with the traditional elementary exercises in rhetoric. After surveying historically in Book III the terminology of rhetoric, he devotes IV to the exordium and statement of facts, V to the proof, VI to the peroration, VII to analysis of the case, thus giving four books to *inventio*. Books VIII–IX analyze style (*elocutio*). Book X discusses reading for style, imitation, writing and revision, translation and paraphrase, practice in abstract discussion, declamation, history, and dialogue, and in speaking extempore from outline. Book XI closes the treatment of *elocutio* with counsels of aptness, and discusses memory and delivery. The last book (XII) considers the orator himself in his personal qualities, his general education, his special training, and the fields at his command. Though Quintilian has no originality of view or treatment, and though his subdivision is sometimes pedantic, his book is the more important as a document; for it furnishes a substantially complete classification of the rhetoric handed down to his time through four hundred years as a branch of education.

Demetrius and Hermogenes.—Indeed, with Quintilian the classical tradition was substantially completed. The writers who carried it on into the Middle Ages were, so far as appears, compilers of manuals. Such was that Demetrius, whose *De Elocutione* (Περὶ ἑρμηνείας) dates probably from the first century A.D.; such, in the second century, was Hermogenes of Tarsus, whose manual was in turn much commented upon by later Greek rhetoricians. The famous treatise *On the Sublime* (Περὶ ὕψους), long ascribed to the rhetorician Longinus, is original, indeed; but it is not so much rhetoric as poetic. The times no longer offering the earlier opportunities of the senate and the forum, Demetrius, Hermogenes, and their followers develop more specific exercises in occasional oratory (Aristotle's third field) and turn it toward descriptive and dramatic display. The show description (*ἔκφρασις*) and the dramatic monologue (*ἠθοποιία*) passed from the schools into the meretricious Greek romances. On the other hand, occasional oratory was directed to the highest aims by the development of Christian preaching, which in time evoked its special art, homiletic.

Medieval Rhetoric. — Medieval rhetoric generally repeated this modified classical tradition without further change. The medieval sense of its educational importance included rhetoric in the *trivium* (*q.v.*); enlisted the exposition of men as eminent as Isidore of Seville and Bede; and gave it place in the medieval cyclopedic compends. Thus BRUNETTO LATINI (1220–1294?), or Brunet Latin, included rhetoric as Book VIII of his typical medieval compend of universal knowledge, the *Tesoro*. Part I of this cyclopedic work surveys history, physics, geography, and zoölogy; Part II, ethics. Part III groups rhetoric with politics, the art of public speaking with the art of government. The *Rhetoric* has some examples from the Bible, some from the Middle Ages, and one striking *ἔκφρασις* is a description of Iseult. Indeed, the examples are largely narrative or descriptive; but the doctrine is the classical tradition, its chief source being Cicero's *De Inventione*. Plainly the classical distinction between rhetoric and poetic was fading.

Renaissance Rhetoric. — In the Renaissance the distinction was quite generally ignored. Interest in the classical rhetoric was stimulated both by the general revival of classical studies and by the discovery at Lodi, in 1422, of a manuscript containing all the rhetorical works of Cicero. But the interest of scholars and men of letters being rather in considerations of diction and even theories of style than in the logic of composition, the Renaissance rhetoric is largely poetic. In this way the history of rhetoric becomes so involved with the history of criticism as to obscure those aspects which are properly pedagogical. While the classical doctrine of *inventio* and *dispositio* is repeated formally, *elocutio* is elaborated with enthusiasm. The minute analysis of figures is part of the general concern with what is called in the English manuals exornation. The gradual shift of emphasis from structure to style, beginning centuries earlier and culminating in the Renaissance, had at least its compensations in the development of critical ideas; but in so far as it affected the actual pedagogy of rhetoric, it was an unhappy deviation. For pedagogy rhetoric yielded very little, even to Erasmus (*q.v.*). The *De Ratione Dicendi* (Bruges, 1532) of Vives (*q.v.*), though it opens with sound philosophy as to words and ideas, proposes the discussion of common speech (*sermo*, not merely *oratio*), and otherwise promises a suggestive originality, is in the main a perfunctory and confused treatise on *elocutio*. Nor is his *De Consultatione* (Oxford, 1523) more than vague repetition of traditional advice. Preoccupation with dignity or elevation of style is not the mood in which either to teach or to learn the best lessons of rhetoric.

English Manuals (1550–1650). — This preoccupation appears in the typical sixteenth and seventeenth century English manuals. Richard Sherry describes his translation of Erasmus (1550) as "*A treatise of schemes and tropes* very profytable for the better understanding of good authors, gathered out of the best grammarians and orators . . . whereunto is added a declamacion that chyldren even strapt from their infancie should be well and gently brought up by learnynge." Thomas Wilson's *Arte of Rhetorique* (1553, revised and enlarged 1560, and several times reprinted), memorable in the history of criticism for his attack on "inkhorn terms," nevertheless devotes most space to figures, and is little more than exemplification of a bare outline of classical tradition. Fenner's *Artes of Logike and Rhetorike* (1584) deals mainly with details of propriety and ornament, without specific doctrine as to composition. John Barton's *Art of Rhetorick* (1634) is conceived as "the skill of using daintie words. . . . Adornation consisteth in the sweetness of the phrase, and is seen in tropes and figures. . . . There be foure kinds of tropes: substitution, comprehension, comparation, simulation. . . . A figure is twofold: relative, and independent. The relative figures are six: repetition, variation, gradation, correction, allusion, composition," etc. Such jargon, often and justly a reproach of rhetoric, is but the *reductio ad absurdum* of rhetorical analysis deviated.

Vossius. — In strong contrast with such laborious futility, the work of Professor Gerard Voss (Gerardus Ioannes Vossius) of Leyden has enduring value. Beginning with lectures on Aristotle in 1599, he published his *Partitiones Oratoriæ* in 1606, revised it in 1609, and finally divided it into *Rhetorices Contractæ* (about 1630), a manual of rhetoric, and *Commentaria Rhetorica* (1633), an exhaustive compend of classical and medieval authorities. His *De Philosophia* (1658) includes a chapter on eloquence. This stands significantly between the chapter on politics and the chapter on criticism, and contains the pregnant sentence: "For eloquence is twofold, oratorical and poetical, and either power is an instrument of philosophy; not in the way of logic, which is an instrument of knowing, whereby logic is the organon of all philosophy, but as an instrument of doing, and in this alone it serves practical philosophy." So large a view was to be expected of the ripe age of so eminent a scholar. For, in spite of a certain false emphasis inevitable in his time, Vossius restores the large outlines of rhetoric. Instead of following indirect and confused tradition, he goes back to the classical sources and intelligently relates to these, with many valuable citations, the doctrine and comment of the early Christian centuries and the Middle Ages. His *Commentaria* goes far in preparing the way for the still desired dictionary of rhetorical terms, and in other ways is the most comprehensive survey of rhetoric since Quintilian.

Jesuit Rhetoric. — The Jesuit teaching of rhetoric appears as strictly classical in the *De Arte Rhetorica* (Lyons, 1710, and often reprinted) of Dominic de Colonia. This catechism of Latin composition is based on Quintilian. It frequently cites the precept of Cicero, and still more frequently quotes his example. Cicero is *the* orator, as Vergil is still *the* poet; and the treatment, though couched as advice to tyros, is largely literary analysis. Citation also of Aristotle, of Demetrius and later Greek rhetoricians, and of Scaliger and Vossius, shows some acquaintance with the development of rhetorical tradition; but the conception remains classical, and the book shows the persistence of Quintilian at Lyons.

Eighteenth Century Rhetoricians. — The concern of the eighteenth century in both France and England with correctness and elegance tended to detain rhetoric in the field of diction and to consider it in aspects related to poetics. This tendency is still evident as late as 1783 in the once famous *Lectures on Rhetoric and Belles Lettres* of Dr. Hugh Blair, which have even been cited to prove that rhetoric in modern times has been merged in criticism. But meantime the permanent pedagogical values of rhetoric had been revealed afresh by Dr. George Campbell. Though considerably more than half of his *Philosophy of Rhetoric* (1776) is devoted to diction, the treatment is more practical in both conception and application; and the first book is an original rehandling of *inventio*. Again, rhetoric analyzes the means of persuasion in evidence and audience. Campbell handles rhetoric as a philosopher; Archbishop Whately, rather as a logician. His manual (1828) is entitled *Elements of Rhetoric, comprising an analysis of the laws of moral evidence and of persuasion, with rules for argumentative composition and elocution.* Nearly half of the discussion is devoted to argument as address to the understanding, about a quarter to persuasion as address to the feelings or will. Style is discussed simply as to perspicuity, energy, and elegance, with but twenty pages on figures. Elocution, in its present sense of delivery, constitutes Part IV. Less original and perhaps less influential than Campbell's, Whately's treatment nevertheless marks the essential lines of rhetoric in the nineteenth century. It is already a long way from Blair.

Bain. — The remaining terms of the rhetoric taught in English to-day are almost all explicit or implicit in the *English Composition and Rhetoric* (1866) of that pioneer of modern psychology, Alexander Bain, professor of logic in the University of Aberdeen. The book is about equally divided between (I) style and (II) kinds of composition. Figures are treated first, indeed, and at considerable length; but they are treated psychologically as are also the "qualities of style." Without being technical, the treatment is based on the modern analysis of the mind. Whately's division of the "qualities" as clearness, force, and elegance has outlasted Bain's, perhaps because it keeps the practical point of view of actual composition, whereas Bain's includes also the critical point of view of appreciation. On the other hand, Bain is the more practical in devoting a separate chapter to the sentence, and another to the paragraph, setting forth the composition of each as a logical unit of discourse. Here is the germ of most recent teaching of composition. Bain may be said to have discovered the educational significance of the paragraph. Part II, on the kinds of composition, is no less original in introducing the fourfold division, now generally accepted, of composition into description, narrative, exposition, and persuasion. Bain's fifth caption, poetry, may be regarded less as a fault of cross-division than as a convenience. Though his revised and enlarged edition (1887–1888) does not fulfill the pedagogical promise of the original work, Bain had already put our generation greatly in his debt by opening some of the most fruitful fields of the teaching of rhetoric in our time.

Recent Teaching in English. — The teaching of rhetoric to-day relies far less than that of previous centuries on analysis of diction. Not only has the elaborate traditional classification of figures been generally abandoned, but the study of style is largely left to courses of literature, that is, to reading without direct application to writing. Such courses of literature as are topical rather than historical, exploring a particular literary form, such as the drama, are largely rhetoric in the sense common for several centuries from the Renaissance; but the dissociation from composition now classifies them as literature. On the other hand, both rhetoric and literature are commonly, though not always, taught by a single department of "English" in both secondary schools and colleges. Within this single administration, rhetoric is usually taught for direct use in composition, literature for the development of appreciation. Though the term *belles lettres*, used for a time to indicate the latter purpose, is no longer current, the purpose itself is at once distinctly recognized and generally sought outside of the scheme of rhetoric.

Current manuals deal with words, therefore, as the expression of students rather than of masters, quoting from masterpieces such examples as may serve for imitation. In the discussion of sentences current rhetoric shows least modification of traditional doctrine. Though less is usually said of rhythm, and though the period is consequently presented in its logical aspects, the current doctrine of the sentence is substantially the classical doctrine presented less orally. The most striking shift of emphasis in teaching is the stress laid on the composition of paragraphs. The teaching of the paragraph has become the primary application at once of the classical *inventio* and of the classical *amplificatio*.

A fourth heading now often used is the whole composition. Under this are distinguished the four kinds of composition: description, narration, exposition, and argument (or persuasion). The classical analysis of appeal to feeling has been generally abandoned; and modern psychology has not yet suggested a new classification for purposes of rhetoric. As fundamental principles of the whole composition, the paragraph, and even the sentence, current manuals present unity, emphasis, and coherence. This is the modern division of the classical *dispositio*. The cross division of style into the qualities clearness, force, and elegance (or ease), though it resembles the classical division of style into kinds, is less firmly fixed. Elegance is applied both to diction and to sentence rhythm; force, where it is not restricted to diction, is equivalent to emphasis; clearness in the same way overlaps coherence. This division, therefore, seems both superfluous and out of line with the recent tendency to segregate considerations of diction and to stress the principles of construction.

Recent discussions of rhetorical theory have brought forward three main ideas: (1) that beneath the accepted fourfold division of composition lies a more fundamental twofold division into what may be called logical composition (argument and exposition) on the one hand, and, on the other, literary composition (narration and description); (2) that writing should be so taught in college as to stimulate and train thinking, in order to make rhetoric more effectively the *organon* of all studies; (3) that in both school and college, rhetoric needs for the full realization of its function the recovery of oral composition. It should surprise no one to reflect that all three are ideas of the classical rhetoric. The third is obviously a return toward the schools of Greece and Rome. The second is hardly less a return to the classical emphasis on *inventio*. The first is the ancient distinction between rhetoric and poetic. For rhetoric is so old that it made its educational survey early along permanent lines of human nature.

C. S. B.

See ARISTOTLE, COMPOSITION, ENGLISH USAGE, ERASMUS, etc.

References: —

Translations: —

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DIONYSIUS OF HALICARNASSUS. *De Compositione*, by W. Rhys Roberts. (London, 1910.)

QUINTILIAN. *De Institutione Oratoria*, by J. S. Watson. (London, 1891.)

Discussions of rhetoric are incidental to several histories of criticism. The best surveys are in the introductions and notes to editions of the works above: Cope and Sandys's to Aristotle; Roberts's to his edition of Demetrius and to both his editions of Dionysius, which contain also glossaries of rhetorical terms; Wilkins's to Cicero's *De Oratore*, and Sandys's to Cicero's *Orator*. Further research will be guided by references in the article above.

Recent Manuals: —

BALDWIN, C. S. *College Manual of Rhetoric*.
GENUNG, J. F. *Practical Elements of Rhetoric* (revised as *Working Principles of Rhetoric*).
HILL, A. S. *Principles of Rhetoric*.
WENDELL, BARRETT. *English Composition*.

RHETORICAL SCHOOLS. — The schools of Rome which were modeled after the Greek schools, taught by the sophists or rhetors. There were the higher schools giving the students a practical training for the public life of the times. For description of these schools see ROMAN EDUCATION and the references appended.

RHODE ISLAND, STATE OF. — Providence plantation was settled in 1636, and Rhode Island in 1638. The two were united and chartered as a colony in 1644, and this was admitted to the American Union, on ratification of the Federal Constitution in 1790, as the thirteenth state. In size, Rhode Island is the smallest state in the Union, having a land area of 1053 square miles. Its total population in 1910 was 542,610, or about the same as in Baltimore or Pittsburg. One half of this was in the cities of Providence and Newport. The density of population is 508.5 persons per square mile, the highest of any state. For administrative purposes the state is divided into five counties, and these in turn into thirty-eight towns and cities. The county, however, is negligible in school administration.

Educational History. — Roger Williams settled in what he chose to call Providence in 1636, and William Coddington, Anne Hutchinson and a few others bought and settled Rhode Island in 1638, establishing freedom of religious worship in each. All were religious refugees from Massachusetts. In 1644 Williams obtained a charter in England, uniting the two plantations. A second charter was obtained in 1663, and continued as the fundamental law until the formation of the present state constitution in 1842.

Church and State, in the seventeenth century, were closely united, and the clergy looked after education with a deep solicitude. In Rhode Island, with its religious freedom and its hospitality to all persons persecuted because of their religion, this religious oversight and interest was largely lacking. As a consequence of this, and of the suffering from Indian wars and the existence of slavery in the colony, education began in Rhode Island only after it was established in the adjacent New England colonies, and its final development was due more to a public than to a religious interest in the schools. The colony, too, grew slowly, it being sixty-five years before there were 10,000 white people in it, and almost a hundred years before there were 18,000. As many of these were adventurers, and many others were conscientiously opposed to any State or Church control of education, no general educational legislation took place until after the close of the colonial period. Such advances as were made were made by the individual towns.

Newport claims to have established a school, by public vote, as early as 1640, and to have set aside one hundred acres of land for the permanent support of the school, "for the encouragement of the poorer sort, to train up their youth in learning." Providence took its first action in 1663, when the proprietors voted that one hundred acres of uplands and six acres of meadow should be laid out as school lands, and "reserved for the maintenance of a school in this town." In 1752 there is mention of a schoolhouse, and in 1767 the citizens voted to build "three schoolhouses for small children and one for youth, to provide instructions, and pay the expense from the treasury, and these schools to be under the supervision of the school committee." A plan for the organization of schools was outlined, was submitted to the inhabitants of the town for approval, and was rejected "by the poorer sort of the people, being strangely led away not to see their own as well as the public interest therein." The town of Barrington founded a school in 1673. The original proprietors of Bristol granted land, in 1680, "for the common improvement, for the encouragement and use of an able orthodox minister, and for the use and encouragement of an able schoolmaster in the town," and in 1682 the citizens voted to provide a school and to make up from the public funds, up to £24 a year, what tuition fees of *3d.* a week did not bring in. A few local attempts were made to instruct the Indians, and a school for negroes was opened in Newport somewhere near 1770, but aside from these efforts and the votes of the towns above given, little seems to have been done until 1800.

The real founder of public schools in Rhode Island was John Howland, a barber in Providence, who was deeply impressed with the need of some form of public education for the children of the city. In 1789 he had helped to found the Mechanics and Manufacturers Association, and the work within this Association impressed upon the members the need of providing educational advantages for children. The movement met with approval in Providence and Newport, but with indifference elsewhere. A memorial was prepared and presented to the legislature in 1799, active work was done, and in February, 1800, the first general education law for the colony or state was enacted. Aside from Providence, no other community carried the law into effect, and so much opposition to it came from the other towns that the law was repealed in 1803, except for the city of Providence. For twenty-five years after the repeal of this law, there was no state school system in Rhode Island, even on paper. A few endowed schools in Newport and some of the other towns, many of them the result of lotteries, supplied whatever of free education existed elsewhere in the state.

The legislature of 1820 made an inquiry as to the schools in the state, and found that there were none outside of Providence, except a few in Newport. In 1821 the legislature appointed a committee to prepare a free school bill, but the committee never reported. In 1825 Newport was granted permission to raise $800 annually to educate those unable to obtain schooling for themselves, and a scheme to start a state school fund by lottery was proposed. In 1827 several towns presented memorials, requesting action, and in 1828 the second free school bill was finally enacted into law. This law formed the foundation upon which the state free school system was eventually built. Towns were authorized to appoint school committees, which should appoint and supervise teachers, and to tax themselves for schools. To aid the towns, a state appropriation of $10,000 a year from taxes on lotteries and auctioneers' licenses, was to be distributed to the towns in proportion to the population in each under sixteen years of age. A state school fund was also begun by setting aside $5000 a year for investment, together with any excess over $10,000 in the auctioneers' licenses and lottery fees. Five years after the passage of this law, a report for the state, compiled by a teacher, showed that there were 323 public schools in operation, for three months' terms, employing 375 teachers; and also 118 private schools, sustained by subscriptions, which were virtual continuations of the public school term.

The beginnings of state supervision were made in 1838, when the schools were first required to report to the Secretary of State. In 1839 the state school law was revised, the state appropriation was increased to $25,000, and the "rate bill" (*q.v.*) was enacted in an effort to lengthen the term. An attempt was made at this time, also, to restore the impaired state school fund, which had been used at different times for state expenses, and the United States Surplus Revenue Fund (see NATIONAL GOVERNMENT AND EDUCATION) was set apart as a special school fund. In the state constitution of 1842 it was made the duty of the legislature to promote public schools, the school fund was made a perpetual fund, and the legislature was forbidden to divert or use the fund for any other purpose, "under any pretext whatever." No other constitutional provisions relating to education have since been added. In 1840 the first child labor legislation forbade the employment of any child under twelve years of age in any factory, unless such child had attended school three months during the year. A few years later this was made prohibitory for all children under twelve, and an educational test was applied to those from twelve to fifteen.

In 1843 the legislature authorized the Governor to appoint a state school agent to visit and inspect the public schools, with a view to their improvement. Henry Barnard (*q.v.*) was appointed, and in his report he outlined a new law to organize better the school system of the state. This became a law in 1845. The office of State Commissioner of Public Schools, to be appointed by the Governor, was created; the powers and duties of the towns were defined; school districts, with trustees, were created within the towns; the examination and certification of teachers and teachers' institutes were provided for; the organization of schools for advanced instruction and the formation of public school libraries were permitted. This same year saw the formation of the Rhode Island Institute of Instruction, an organization which has rendered much valuable service. The permission to organize schools for advanced instruction was to legalize the high school which was organized at Providence in 1843, and to which there was much opposition. This was the first free public high school in the state. Newport opened a senior department of the grammar school soon afterward, and high schools were established at Warren in 1847, and Bristol and Woonsocket in 1849. With the annexation of Pawtucket from Massachusetts in 1862, another high school was added, making six high schools in the state by 1870. Excepting the formation of a state normal school in 1854 (which was abandoned in 1865), the increase of the state appropriation to $50,000 in the same year, and the abolition of the " rate bill " (*q.v.*) in 1869, there was no educational legislation of any importance from 1845 until 1870.

The creation of a State Board of Education in 1870, to aid the State Commissioner and to have general supervision and control of all state schools, marks the beginning of a new era in school legislation in the state. In 1871 the state normal school was reëstablished. In 1872 the State Board of Education was given power to appoint the State School Commissioner; the state aid for common schools was increased to $90,000, and state aid was first granted for teachers' institutes and for evening schools; the terms of school committeemen were increased from one to three years, with only one third to be elected each year; school superintendents for each town were to be elected or appointed; and full annual reports from the town school officers to the State School Commissioner were required. In 1875 the free library law was enacted, state aid for free libraries granted, and improved statistical returns required from the schools. In 1883 the first state compulsory education law was enacted, and the state appropriation for schools was further increased to $120,000. In 1884 schools, instead of the district, were made the unit for the distribution of state funds, and towns were required to duplicate the state grants; permission to towns to abolish the district system (*q.v.*) was granted; the election of town school superintendents was placed in the hands of the school committee; and the first attempt to prescribe any subjects of instruction was made by a law requiring the teaching of temperance — physiology and hygiene. In 1885 a state home for dependent and neglected children was created. In 1888 the Rhode Island State College of Agriculture and Mechanical Arts was established and opened at Kingston, superseding the previous agriculture grant to Brown University. In 1892 all private schools were required to be registered, and the State Board of Education was given the oversight of all deaf, blind, and feeble-minded children in the state. In 1894 a factory inspection act was passed, and factory inspectors appointed. In 1896 the school committee of the city of Providence was given the power to elect its city superintendent of schools, and to manage the schools, in large part, free from the interference of the city council. In 1898 the consolidation of small schools was authorized, and a bounty for so doing offered; state aid was granted for the first time to high schools; and a state examination system for teachers' certificates was begun.

Present School System. — At the head of the present school system is a State Board of Education and its appointed executive officer, the Commissioner of Public Schools. The State Board of Education consists of the Governor, Lieutenant Governor, and six citizens elected by the legislature, two each year for three-year terms. Two must be elected from Providence County, and one from each of the other counties. The Governor is president, and the Commissioner is *ex officio* secretary. The members receive only their necessary expenses. To this board is given the general supervision and control of the public schools, normal schools, normal institutes, public libraries, and the education of defectives in the state. They may make rules and regulations for the enforcement of the school law, and for the government of libraries; may establish traveling libraries, or aid such libraries; may adopt blank forms and registers for use in keeping records and making reports by all public and private schools; apportion, with the aid of the Commissioner, a number of the special state appropriations for educational purposes; approve the high school course of study in all state-aided high schools; recommend to the Governor for appointment those to be admitted to the state institutions for the deaf, blind, feeble-minded, and dependent; and are given the power to approve the standards of lighting, heating, ventilation, seating, and sanitary arrangements for all schoolhouses in the state. The board acts *ex officio* as a Board of Control for the State School for the Feeble-minded, and for the State Normal School. The state board also appoints, for one-year terms, the State Commissioner of Public Schools and a State Inspector of Libraries.

The Commissioner of Public Schools appoints an assistant commissioner at $2000, and his clerical assistance, for which $1750 is allowed. He acts as the executive officer of the State Board of Education, and in reality performs many of its functions. In the class of general duties he is charged by law with the visitation of the schools of the state; the making of public addresses on educational topics; the furnishing of blanks and registers, and manuals for the school observance. He apportions the income of the state school fund, as appropriated by the legislature, to the towns; approves all grants of state aid to high schools and consolidated schools; and has charge of all expenditures for teachers' institutes and public lectures in the towns. He helps libraries in the selection of books, and is instructed to make recommendations to the towns, with a view to bringing about uniformity in textbooks. He has power to decide appeal cases, and his opinion, if submitted to and approved by a Justice of the Supreme Court, is final. He makes an annual report to the State Board of Education.

There are no county school authorities.

For each town a school committee, usually of three, is elected for three-year terms, one third each year. Towns organized under a city form of organization, as Providence, have city boards of education. Each town must elect a town superintendent of schools each year, and fix his salary, though two or more towns, having not over sixty schools, may unite in such employment. State aid is granted toward the superintendent's salary, the state doubling any amount paid up to $750. All superintendents must be certificated by the State Board of Education. Each school committee elects, also, its own chairman and clerk, and the town treasurer acts *ex officio* as treasurer for the schools. Each town school committee must provide a sufficient number of schools, adopt courses of study for them, and furnish free textbooks and supplies; may transfer children, and suspend pupils; may close small schools; may select all teachers, and dismiss them for cause; must provide for the taking of an annual school census; may condemn land for school purposes; may make rules and regulations as needed; must appoint a truant officer; may provide free meals for school children; and must make an annual report to the State Commissioner, and may spend $40 in printing the same.

School Support. — The income from the state permanent school fund is appropriated by the legislature for distribution to the towns. At present this is fixed at $120,000 a year, and this is distributed to the towns on the basis of $100 to each school, though not over fifteen to a town, and the remainder on the basis of the school census, five to fifteen years of age. Each town is required to appropriate an equal sum, and this can be used only for teachers' wages. All forfeited apportionments and the net proceeds of auctioneers' licenses are added to the permanent fund, while the net proceeds of dog licenses are used for annual maintenance in the towns where paid. The state also makes a large number of small special appropriations.

Teachers and Training. — The state employs a total of about 2300 teachers each year, over one third of whom are in the city of Providence. Of these, 60 per cent have had normal school training, 25 per cent are high school or academy graduates, and 14 per cent are college or university graduates. The average salaries paid in 1911 were $642 per year for men, and $587 for women. A state salary law, enacted in 1909, requires a minimum salary of $400 a year, and grants to towns one half of the extra amount necessary to pay this over salaries paid in 1909. All teachers' certificates are granted by the State Board, under rules and regulations adopted by it, the state certification system having completely displaced the old town licensing system. The state grants a pension to all teachers who have taught thirty-five years, twenty-five of it in the state, equal to one half of the average salary during the last five years of service, though with a maximum annual grant of $500. For the training of future teachers the state maintains the Rhode Island Normal School, at Providence, a large and important school.

Educational Conditions. — The state is small and densely populated, and its system of school administration is not greatly different from that of a well-organized county in a western or southern state. Rhode Island is essentially a business and manufacturing state. Only 3.3 per cent of the total population in 1910 were living under rural conditions, while 80.7 per cent lived in cities of over 10,000 inhabitants. One third of the total population is foreign born, and about two thirds is either foreign born or of foreign parentage. The negro element forms a little over 2 per cent of the total, and accordingly we find any discrimination on the basis of color forbidden. The state has relatively good laws on child labor, factories, and attendance. Four state factory inspectors, one of whom must be a woman, look after the enforcement of the child labor and the factory laws, and town attendance officers look after school attendance. All private and parochial schools must coöperate in enforcing the attendance laws. Private and parochial schools, to be accepted for the required attendance, must be good, must keep public school teachers' registers, and must be taught in the English language. Incorrigibles and persistent truants may be sent to the state reform school. Attendance from seven to fifteen is required, unless the elementary course has been completed, or unless the child is over fourteen and lawfully employed. All children under sixteen must possess age and schooling certificates, and these cannot be issued unless the child "can read at sight and write legibly simple English sentences." All schools receiving state aid, directly or indirectly, or exemption from taxation, must be open to state inspection. As practically all nonstate schools receive such exemption, almost all are open to inspection. Of the total school attendance in the state, about 77 per cent is in the public schools, 19 per cent in Catholic parochial schools, and about 2 per cent in private schools.

Evening schools are well developed in the cities and towns, fifty-three being maintained at last report. A medical inspection act requires the appointment of medical inspectors by the towns, and grants $250 a year aid for this purpose. All pupils, teachers, and janitors must be given a medical examination at least once each year.

Secondary Education. — Every town must maintain a high school, or arrange with an adjoining town to care for its high school pupils. The course of study must be approved by the State Board, if state aid is expected. This is granted on the basis of $20 each for the first twenty-five pupils, and $15 each for the second twenty-five pupils, in average daily attendance. There were 22 public high schools in the state at date of last report, with an enrollment of over six thousand pupils.

Higher and Special Education. — The Rhode Island College, located at Kingston, is the agricultural and mechanical college. It receives the Government grants for agricultural instruction, and the state also appropriates $30,000 a year toward its support. Its attendance is 250. Brown University (*q.v.*) at Providence, under Baptist control, is a large and important institution, opened in 1764, and is the only collegiate institution in the state offering full collegiate work. Both institutions are coeducational.

The state maintains a number of scholarships in the Rhode Island School of Design, at Providence, and two members of the State Board of Education have seats on the School of Design Board of Directors. The state aid granted to this institution is $8000 a year.

The special institutions maintained by the state are the Rhode Island Institution for the Deaf, at Providence; the Rhode Island School for Feeble-minded, at Slocum; the State Home for Dependent and Neglected Children, at Providence; the Oaklawn School for Girls, at Howard; and the Sockanosset School for Boys, also at Howard. The last two are reformatory institutions. A number 'of feeble-minded pupils are cared for outside the state, and the blind are sent to the Perkins Institution for the Blind at Boston. E. P. C.

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RHODES SCHOLARSHIPS. — Scholarships founded by the will of Cecil John Rhodes (1853–1902) to be awarded to citizens of the British Colonies, and to students from the United States and Germany. The scholarships are to be held at the University of Oxford, the founder's Alma Mater, and are of the annual value of £300 (£250 for German scholars), tenable for three years. The trustees of the will are the Earl of Rosebery, Earl Grey, Mr. Albert Beit, Sir Lewis Lloyd Michell, Mr. Bourchier Francis Hawksley, and Dr. Leander Starr Jameson. Cecil Rhodes devoted his life to the service of the British Empire. Prevented by climatic conditions from living in England for any length of time, he settled in South Africa only a few months after entering Oriel College, Oxford. In South Africa financial success opened up to him great opportunities for imperial service, inspired throughout by faith in the British Empire and desire to advance what he regarded to be its beneficent influence for civilization. The foundation of the scholarships was inspired by the same motives. To the maturing of a scheme for promoting the advancement of the British Empire Rhodes had already turned his thoughts as early as 1877. The plan of founding scholarships was not developed until 1899, when he drew up his sixth will, further elaborated by codicils. The intentions of the founder are best stated in his words, as taken from the will: —

> Whereas I consider that the education of young Colonists at one of the Universities in the United Kingdom is of great advantage to them for giving breadth to their views, for their instruction in life and manners, and for instilling into their minds the advantage to the Colonies as well as to the United Kingdom of the retention of the unity of the Empire. And whereas in the case of young Colonists studying at a University in the United Kingdom I attach very great importance to the University having a residential system such as is in force at the Universities of Oxford and Cambridge, for without it those students are at the most critical period of their lives left without any supervision. . . . And whereas I also desire to encourage and foster an appreciation of the advantages which I implicitly believe will result from the union of the English-speaking peoples throughout the world and to encourage in the students from the United States of North America who will benefit from the American Scholarships to be established for the reasons above given at the University of Oxford under this my Will an attachment to the country from which they have sprung but without I hope withdrawing them or their sympathies from the land of their adoption or birth. Now therefore I direct my Trustees as soon as may be after my death and either simultaneously or gradually as they shall find convenient and if gradually then in such order as they shall think fit to establish for male students the scholarships hereinafter directed to be established each of which shall be of yearly value of £300 and be tenable at any College in the University of Oxford for three consecutive years.

For colonial students seventy-eight scholarships were assigned, and for the United States two scholarships for each state or territory. The scholarships are to be paid out of the income of the fund left for the purpose. By codicil of January, 1901, Rhodes left five yearly scholarships of the annual value of $250 for three years for students of German birth to be nominated by the German Emperor.

After the death of Mr. Rhodes the trustees appointed Dr. George R. Parkin, president of Upper Canada College, Toronto, as their agent. Dr. Parkin conducted the negotiations with the University and Colleges of Oxford for the conditions under which Rhodes scholars would be received, and visited the centers from which the scholars were to be drawn to arrange schemes for their selection. Francis J. Wylie, M.A., Fellow of Brasenose College, Oxford, was appointed as representative of the trustees to act as adviser to the

Rhodes scholars and negotiator between those interested in the scheme and the University.

So far as the University of Oxford is concerned, the only condition for admission was that prospective scholars should pass the Responsions (*q.v.*) or an equivalent examination. The individual colleges expressed their willingness to accept Rhodes scholars up to a certain number, provided that they passed their entrance requirements. It was the desire of Rhodes that the scholars should be distributed among the colleges. As a general rule, five is the maximum number of Rhodes scholars admitted in one year by any college.

Selection. — The most difficult matter to be settled was the mode of selection, left in the hands of committees of selection appointed in each state or colony. The award of scholarships could not be by competitive examination alone. That was excluded by the terms of the will. Nor could one uniform system of selection be established to cover so wide an area as that provided for, in which different systems of secondary education obtained and students attained maturity at different ages. On the whole, it seemed undesirable to appoint scholars directly from secondary schools, for if the ends aimed at in the will were to be attained, it was desirable to send the scholars to Oxford at an age when they were not too old to adapt themselves to a new environment and not too young to appreciate the advantages and opportunities afforded by the change. The age limits set by the will were nineteen and twenty-five, and these have been generally adopted, with the exception of West Australia (17–25), Queensland and Jamaica (18–25), Newfoundland (18–21), and South Africa (19–24). Candidates were also to be unmarried. It was generally felt that the mode of selection suggested by the will merely defined the qualities desirable in the candidates, and could nowhere be followed in detail. The statement of Rhodes on the subject was as follows: —

> "My desire being that the students who shall be elected to the Scholarships shall not be merely bookworms I direct that in the election of a student to a Scholarship regard shall be had to (i) his literary and scholastic attainments, (ii) his fondness of and success in manly outdoor sports such as cricket, football, and the like, (iii) his qualities of manhood, truth, courage, devotion to duty, sympathy for the protection of the weak, kindliness, unselfishness, and fellowship, and (iv) his exhibition during school days of moral force of character and of instincts to lead and to take an interest in his schoolmates, for those latter attributes will be likely in after life to guide him to esteem the performance of public duties as his highest aim."

Qualifications. — The general qualifications accepted in most of the colonies and states are the age limits, citizenship, domicile, and the passing of Responsions (*q.v.*). The Responsions examination papers are set and examined by the Oxford authorities, and examination centers conducted under the respective committees of selection are arranged. The examination is merely qualifying, not competitive. Candidates from such colleges and universities as are affiliated with the University of Oxford are exempt from Responsions.

In the United States the additional qualifications are that the scholars shall have reached the end of the sophomore year at a recognized degree-granting university or college in the country, except in the state of Massachusetts, where the committee of selection may appoint from the secondary schools. Candidates must furnish the committees of selection with certificates of age, and a statement of their educational career, including record in athletics and testimonials from schoolmasters and professors in colleges. The committees of selection are required to interview each candidate personally, except where for special reasons this is not necessary. The arrangements for the admission of elected scholars to the Oxford College are conducted through Mr. Wylie.

The qualifications for election are very similar in the British Colonies. Local qualifications may be imposed, dealing with (1) age (the limits in some cases being changed); (2) residence and domicile (candidates or their parents must have lived in the respective colony for a certain number of years); (3) education (candidates must have attended secondary schools and a specified university either for part or for the whole of a degree course). All candidates must pass the Responsions or be exempted from them under the statute for affiliated colleges.

Rhodes Scholars at Oxford. — At Oxford the Rhodes scholars may enter as undergraduate or postgraduate students and may read for honors or pass degrees. The postgraduate degrees which are open to qualified scholars are Bachelor in Letters, Science, or Civil Law. It is difficult as yet to generalize, but it may be said that up to the present the majority of Rhodes scholars, Colonial, American, and German, have taken up the study of law or jurisprudence, both regarded as excellent preparation for public service. Indeed, this to a large extent carries out the intention of the founder, and the late W. T. Harris (*q.v.*) remarks in his Report for 1902 as Commissioner of Education: "The Rhodes bequest is the most timely of gifts for higher education, because it gives opportunity to begin this education of that class of our population which will furnish our consulates, our home offices, and our embassies with attachés. Out of the most successful of these will come by and by our foreign ministers and our home experts in diplomacy.

"England is the best place in which to begin this work. The excellence of the University of Oxford is without doubt the training of the ready gentleman who cannot be pushed off his feet by an attack directed upon the weaknesses of his personality. His training at Oxford gives him that secure self-possession and self-respect which commands the respect of his fellows."

Literæ Humaniores, or the classical school, receives a number of students, but as a rule the previous preparation of non-English schools is inadequate for the demands for this degree. Modern history and English literature also attract a small proportion of the scholars. According to the Report of the Rhodes Trust for 1910–1911, distribution of the Rhodes scholars was as follows: For the degree of B.A.: *Literæ Humaniores*, 14; natural science, 18; jurisprudence, 44; history, 18; theology, 10; English literature, 8; mathematics, 6; modern languages, 3; engineering, 5. For advanced or specialized courses: B.C.L., 11; B.Sc., 6; B.Litt., 10; M.B., 10. A number of others were candidates for diplomas. The showing of the scholars has on the whole not been above the average. So far as the American scholars are concerned, the reports of their tutors afford an interesting basis of comparison between the preparation which they have received at home in school and college and the attainment which for their age and standing they are expected to have reached at Oxford. For their energy, industry, seriousness, keenness, and interest the reports have nothing but the highest praise. But the feeling is that on the whole the American scholar is superficial and inaccurate, is a dilettante rather than a close student, is restless and not good at long spells of work, is not clear or precise in expression, and, finally, "knows nothing well, but knows something about a great many things." Of the scholars as men of character with influences for good, the Oxford authorities speak in the highest terms. Many of the Rhodes scholars have distinguished themselves in athletics. In 1907 an American scholar was elected president of the Oxford Athletic Club, and in 1908–1909 out of five representatives in the track meet against Cambridge, four were Americans. Socially it was felt for a time that the Americans kept somewhat to themselves, although at an early meeting it was decided not to form any distinct or separate organizations. It is to be remembered, however, that the American scholars, at any rate, and many of the colonists are a few years above the average age of the Oxford student and that they come up with entirely different traditions. On the whole, barriers tended to break down, and the Rhodes scholar is tending more and more to identify himself with the social life of Oxford and of his college, to form friendships, and to understand the English attitude in just the spirit desired by the Colossus of South Africa.

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RHODES, UNIVERSITY OF. — Rhodes, owing partly, it is to be presumed, to its central position in the Greek world and its policy of neutrality in Greek politics, became early an important seat of learning; in the last century of the pre-Christian era and the first century A.D. it shared with Athens the distinction of being the most prominent university center in the ancient world and of attracting to its schools the largest number of students. It was from Athens and Rhodes, we are told, that Ptolemy Philadelphus, in the first part of the third century B.C., collected books for the recently established library at Alexandria. Rhodes was also the birthplace of many distinguished men of letters — among others, of the epic poet Peisander, of Cleobulus, one of the Seven Wise Men, of the lyric poet Timocreon, of the comedy writer Alexandrides, of Eudemus, the Peripatetic philosopher, and of Panætius, the Stoic philosopher. The name of Apollonius Rhodius, the author of the *Argonautica*, is inseparably connected with the island, for it was there that Apollonius lived and taught for many years, after he retired from Alexandria. Dionysius Thrax also made Rhodes his home for the greater part of his life.

The studies which were most favored at Rhodes and were chiefly influential in giving celebrity to the island in an educational way were rhetoric and philosophy. According to the tradition, the Athenian orator Æschines, after his defeat at the hands of Demosthenes in the celebrated oratorical contest over the golden crown, retired to Rhodes about 330 B.C. and set up a school of rhetoric there. Whether the study was, as is further stated, thus first established at Rhodes by Æschines or not, it doubtless flourished there from that time onward. We hear little, however, of its course until toward the end of the second century B.C. In the first century B.C. the island was visited by many distinguished Romans, — among others, by Mark Antony, Cæsar, Cicero, Brutus, and Cassius, — who listened to the lectures of the professors and studied in the schools. The most famous of the teachers of rhetoric were Apollonius Malacos and Apollonius Molon. The latter was heard by both Cæsar and Cicero, and through Cicero he influenced forcibly the course of Roman oratory. Toward the end of the first century B.C. the rhetorician Theodorus of Gadara was settled at Rhodes, and his lectures were attended there by Tiberius, who was later Emperor, during the time of the latter's retirement to the island. The Rhodian oratory was said to have a distinctive character and to hold a position midway between the turgid Asiatic style and the terse and chaste Athenian style.

The various schools of philosophy were well represented at Rhodes. The most famous of the philosophers whose names are associated with the island were Panætius and Posidonius. Panætius was born at Rhodes, but taught at Rome and Athens. Posidonius, though a native of Apamea in Syria, held his school at Rhodes. While he was nominally a philosopher, his interests extended over many fields, and his lectures dealt apparently with moral philosophy, physical science, and history. His school attracted the Romans in great numbers to Rhodes. Among those who heard him were Cicero and Pompey. Both Panætius and Posidonius influenced Cicero strongly. On the death of Posidonius his school passed into the hands of his grandson, Jason.

Besides the schools of rhetoric and philosophy there were various other schools at Rhodes, — notably schools of grammar, architecture, painting, and geography. The most important of the grammarians was Dionysius Thrax. In the principate of Antoninus Pius the city of Rhodes was partly destroyed by an earthquake, and it never came into great prominence after that time. J. W. H. W.

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RHODESIA, EDUCATION IN. — Rhodesia is administered by the British South African Company. The Company instituted public education in 1899 when a Director of Education was appointed for southern Rhodesia. This Department in addition to the Director now has a clerical staff of three, and three inspectors. Under the Department there are nine secondary schools (including secondary departments), thirteen farm schools, twenty urban schools, 120 native and three colored schools. The schools are supported by the government. There is no training institution for teachers, but bursaries enable women teachers to attend Grey College, Bloemfontein. O. W.

See South Africa, Education in.

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RHYTHM. — The regular recurrence of similar phases of any phenomenon after longer or shorter intervals. The perception of a series of rhythmical, auditory, tactual, or visual stimuli is attended by a peculiarly agreeable feeling. In many, if not all, such cases, there is a tendency to movements of the muscles of the limbs or throat or other parts of the body in unison with the time of the rhythmical series. The grosser movements of the limbs, as in walking and in swinging the arms, become rhythmical because of the tendency to emphasize one side of the body over the other in muscular performance. Even the more automatic physiological processes occur in various rhythms.

So fundamental is this tendency to rhythm that stimuli which are presented objectively in a perfectly uniform manner become broken up into a series of rhythms in which a subjective emphasis is placed upon the stimuli at regular intervals, as, for example, in listening to the tick of a clock.

It is a well-known fact that rhythm aids in physical work, and experiment shows that the same is true of mental work. In experiments with the ergograph the subjects tend to fall into a regular rate of lifting the weight. Adult writing is characterized by a series of rhythmical movements which distinguish it from the writing of children. It has also been shown that there are periods of greater or less energy throughout a day's or even a season's work which tend to recur rhythmically. The well-known phenomenon of fluctuation of attention is another instance of rhythm occurring in the mental life. Rhythmical tendencies are also present in human speech and often in prose literature. The fundamental character of rhythm is also made evident by the tendency of early literature to take the form of poetry, and by the liking of children for verse where the rhythm is very marked, and also in the pleasure that is derived from dancing and similar forms of rhythmical movements. E. H. C.

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RHYTHM. — See Musical Notation.

RICE, VICTOR MOREAU (1818–1869). — State Superintendent of Schools; was graduated from Allegheny College in 1841. He taught at Buffalo and was city superintendent of schools there from 1851 to 1854. He was State Superintendent of Public Instruction in New York from 1854 to 1857 and again from 1862 to 1868. He was active in the establishment of normal schools and the abolition of the rate bills, which made the schools of New York free. W. S. M.

RICHARDS, JAMES B. (1817–1886). — Founder of schools for feeble-minded children; was educated in the public schools of Massachusetts. He was a teacher in Chauncy Hall (Boston), and later was associated with his father-in-law, Samuel G. Howe (*q.v.*), in the organization of a school for feeble-minded children. In 1852 he became the principal of the newly organized Pennsylvania School for Feeble-minded. He was the author of several papers and reports on the care and training of the feeble-minded. W. S. M.

See DEFECTIVES, SCHOOLS FOR.

RICHARDS, ZALMON (1811–1899). — Educator; was graduated from Williams College in 1836. He was teacher in the district schools of Massachusetts; principal of academies at Cummington, Mass., and Stillwater, N.Y.; and principal of the preparatory department of Columbian University at Washington. He was one of the founders of the National Education Association (*q.v.*), and its president in 1858. His publications include *Historical Sketch of the National Education Association*, and numerous papers on educational subjects. W. S. M.

RICHELIEU, JEHAN ARMAND, DUC DE (1585–1642). — The educational significance of Richelieu in the history of France is not slight. His aristocratic temper, no less than the enormous constructive work he was called upon to do, prevented him from taking the least interest in the almost complete lack of elementary education; but for higher education he did much. He himself received a scanty education, first, as a young noble, in the Collège de Navarre and Pluvinel's Academy; then, when he was destined for the Church, in the St. John Lateran College. Seeing no escape from the clerical life, his ambition seems to have concentrated on academic and theological distinction, and he became an assiduous student. This led him, when he became a bishop, to press for a reform of clerical education. The majority of his clergy had had no training, and had been submitted to no intellectual tests whatever. He coöperated with Cardinal de Bérulle in forming the first seminaries for the education of priests (in the first decade of the seventeenth century), as distinct from the old episcopal schools, which were either transformed or in decay. His breach with the Church put an end to his educational influence among the clergy, but he remained a generous patron of the Sorbonne.

As chief minister of Louis XIII he did nothing for education in the strict sense. Not only was there no demand for it, but his labors in other directions were gigantic. His ideal for the people at large was placid content, with neither too much nor too little money, and did not include instruction. But he did much to foster the higher literary culture of France in his later years. The influence of the Renaissance in France had been promoted by the coming of the Medicis, but retarded by the long feudal and religious troubles. A number of lay writers were now preparing the new culture, and Richelieu, both personally and through his niece, the Duchess d'Aiguillon, was a warm patron of Corneille (with whom he quarreled after a time), Voiture, and the leading writers. His own literary work was poor, but it is clear that he took a genuine interest in the advance of culture. He pressed France to rival the literary supremacy of Spain and Italy, and set a profound and far-seeing program for the Académie Française, which he founded. Hearing, in 1634, that a group of Parisians were in the habit of meeting occasionally for a modest discussion of letters, he pressed them to form a *corps*, or legal corporation, enlarged their numbers, and became first president of the new Academy. The task he set them was to forge the language, which was then very imperfect and erratic, and make it a finer implement. They were to create a standard Dictionary, Grammar, Rhetoric, and Poetic. Richelieu did not live long enough to see the famous Dictionary completed, and the rest of his program was abandoned. Hallam describes the Academy as "the most illustrious institution in the annals of letters." J. Mc. C.

See ACADEMY.

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RICHMOND COLLEGE, RICHMOND, VA. — An institution established by charter in 1840 by a body of trustees to whom was transferred the Virginia Baptist Seminary, founded in 1832 by the Virginia Baptist Education Society for the training of ministers. The work consisted at first of two years of preparatory and of two years of college work; a junior class was added in 1845 and a senior class in 1848. Work was suspended during the Civil War, but was renewed in 1866. In 1872 a memorial fund was collected, and buildings were erected. A new library and museums were established; and commercial and law departments were added. Women were admitted to the liberal arts classes in 1898. Ten years later the College began to coöperate with the Virginia Baptist Education Commission in collecting funds for the establishment of a Woman's College under the control of the trustees of Richmond College. A conditional grant of $150,000 was also made by the General Education Board, and this sum is to be the nucleus of a fund for the further extension of the equipment and instruction of the

College. Collegiate work, for entrance to which fourteen units of high school work are required, is given, leading to the degrees of B.A. and B.S. A school of law giving two years' work leading to the LL.B. degree is also maintained. The enrollment of students in 1910–1911 was 336. There is a faculty of twenty-two members.

RICHTER, JOHANN PAUL FRIEDRICH, "JEAN PAUL" (1763–1825). — The great German humorist, born in Wunsiedel, Bavaria, was the son and the grandson of schoolmasters. His father became later a pastor, a calling for which the son undertook training at the University of Leipzig. Theology lacking in interest, he turned his attention to the study of literature. His plans suffered change, owing to the needs of his widowed mother. During several years he taught, first serving as a family tutor, and later conducting a private school with seven pupils. Although he had a firm hold on these charges and struggled to teach them as he conceived his office, formal instruction was notably wanting. His literary activity asserted itself during these early days of struggle with poverty and elusive fame as an author. The peculiarities of his style and the oddity of ideas at first delayed the reception of his writings, and eventually won for him the German characterization of "Jean Paul, der Einzige." He finally settled at Bayreuth and devoted his time to writing, showing a remarkable productivity which filled some sixty volumes. Among these may be mentioned *Quintus Fixlein* and *Maria Wuz* as bearing on education. With all his dreaming and fantastic traits he possessed a rare power in describing childhood and youth.

His chief consideration of the problems of education is found in *Levana, or the Doctrine of Education* (1807). Adopting for the title the Roman goddess of newborn children, he wrote out of his experiences as a teacher for the benefit of parents, especially mothers. In spite of its subtitle, the book is not a systematic treatise; nor is it a popular work. He criticized Rousseau's *Émile* as a negative, immoral, and futile scheme, but accepted the humanizing point of view of this reformer. With a tender regard for childhood, he would break the bondage of the schoolroom in order to give their early life a joyous freedom. In detecting the great educative functions of play, dancing, games, music, and fairy stories, he became a forerunner of Froebel and the kindergarten. Punishment is an "unchildlike word." Because of his keen appreciation of woman's nature, the treatment of female education is one of the most valuable parts of the book. Physical and moral education receive attention. Religious teaching is to proceed without catechisms, formulæ, and attendance on worship. He reminds one of Locke in the little space given to intellectual education or instruction. With criticisms for the "classical parrots," he urges the vernacular as the true subject matter of instruction. The work closes with a dream of the "Paradise of Children." *Levana*, not written for pedagogues, and supported by his literary reputation, reached a wide culture group and gave permanent service in the humanization of education in the nineteenth century. Many of his ideas, in the form of aphorisms, have passed into the common language of education. "The art of education ought to aim at a standard of elevation superior to what may happen to be the spirit of the time — for the child is to be educated not for the present merely." "The spirit of education is nothing more than an endeavor to liberate by means of a freeman, the ideal human being which lies concealed in every child." "To write upon education means to write upon almost everything at once; for it has to care for a microcosm of the microcosm." "The best and most complete education cannot exhibit its true power upon one child, but upon a number of united children." E. F. B.

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RICKETS. — A complex disease characterized by constant lesions in the bones and disturbances of nutrition. It is a matter of dispute whether the changes in the bones are of an inflammatory nature or the result of disordered nutrition; but the general opinion is that the cause is a lack of proper food, with hereditary tendency. The disease occurs most frequently from the sixth to the twentieth month of life and affects both sexes equally; it occurs more frequently among certain races, for example, the negroes and the Italians; is much more frequent and more pronounced in the case of the poor than in the case of the well-to-do, and more frequent in the city than in the country; the phenomena of rickets are at their maximum toward the end of the winter, at a minimum in autumn; and the disease is more frequent in the temperate zones than in the tropical and subtropical countries or the extreme north. Rickets is said to occur seldom in white children on normal breast feeding; it is rarely absent in babies fed for a long time exclusively on proprietary food without fresh milk. Its significance for school hygiene lies in the fact that school children who have suffered from rickets as infants are more liable to develop spinal curvature, flat foot, and the like, and hence should receive special care during the school period with regard to diet, posture, physical exercise, and general hygienic surroundings.

W. H. B.

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RICKOFF, ANDREW JACKSON (1824–1899). — School superintendent; educated at Woodward College, Cincinnati. He was superintendent of schools at Portsmouth, Ohio; principal of schools at Cincinnati; and from 1867 to 1882 superintendent of schools at Cleveland. He was the author of a series of arithmetics and many papers on educational topics. He was president of the National Education Association in 1859.

W. S. M.

RIDDING, GEORGE (1828–1904). — English bishop and head master of Winchester College, who undertook the difficult task of reforming and giving new life to the oldest and most famous and most conservative of the Great English Public Schools. Ridding, whose father was second master at Winchester, was a scholar of the College from 1840 to 1846. Although "head of the roll" for New College, he was ousted from his scholarship by two founder's kin. He went to Balliol College instead and obtained a first class in classics, the Craven scholarship, and a mathematical fellowship at Exeter College. In 1858 he married the daughter of Dr. Moberly (*q.v.*). In 1863 he was appointed second master at Winchester and three years later he was elected head master. He at once devoted himself to reforms. He imported a first-class mathematician and scientist, George Richardson, from Cambridge, and made both mathematics and science a reality. In his own teaching of classics he broadened the area by the introduction of the writing of English essays, the study of English history, and the placing of Chaucer and Bacon side by side with Vergil and Cicero. But his great changes were the enlargement, amounting to re-creation, of the site and buildings. Four new houses of thirty boys apiece, under as many new masters, were substituted for the unsanitary barracks, called "Commoners"; and the scholars' chambers, in which they both worked and slept, were doubled by the annexation of the nonresident fellows' chambers above these, so that they now worked in one and slept in another. The other change, even more important in its results to the school life, was the extension of "Meads," Ridding buying up land and making alterations out of his own pocket.

The result of these changes, on which Ridding spent some £20,000 of his own money, and of the fame of his broad views shown in every department of education and school life was that the numbers in the school rose from 274 in 1866 to 420 in 1871, at which it was fixed as being as large as one man could personally know and govern. When in 1884 Ridding retired to the organization of the new bishopric of Southwell, which for twenty years he governed with the same breadth of mind and generosity, he left Winchester with the reputation of the premier school of England for scholarship and morale, while of himself the old Warden of New College, who had been opposed to most of the reforms, confessed that for them he deserved the title of *Wykehamus alter.*

A. F. L.

See Winchester College.

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RIDPATH, JOHN CLARK (1840–1900). — Author of school histories; was graduated from De Pauw University in 1863. He was instructor in academies in Indiana and professor in De Pauw University. He wrote a series of school histories and numerous popular historical works.

W. S. M.

RIESE (also **RIES, RYS, RYSE**), **ADAM** (1492–1559). — German Rechenmeister, born at Staffelstein, near Bamberg. He was the author of the best known textbooks in arithmetic in the sixteenth century and his popularity is evidenced by the current German saying "*nach Adam Riese*" (*cf.* "according to Cocker" in English). Riese was a teacher of arithmetic at Erfurt in 1522, and in 1525 at Annaberg, where he also served as bookkeeper at the mines. He was the most influential of all the Germans in replacing counter reckoning (*auff der Linien*) by the written computations (*auff Federn*). He wrote three textbooks: (1) *Rechnung auff der linihen gemacht durch Adam Riesen vonn Staffelsteyn, in massen man es pflegt tzu lern in allen rechenschulen gruntlich begriffen anno 1518*, a work on reckoning on the line abacus. (2) *Rechenung auff der Linihen und federn (in zal, mass und gewicht) auff allerley handierung gemacht (und zusamen gelesen) durch Adam Riesen (von Staffelstin), Rechenmeister zu Erffurdt in 1522. Jar.* This was a shorter textbook than the first, with the addition of written computations. (3) *Rechenung nach der Lenge auff den Linihen und Feder. Darzu forteil und behendigkeit durch die Proportiones Practica genant Mit* *grüntlichen unterricht des visierns. Durch Adam Riesen in 1550. Jar.* This is the best known work, and, while making no new contribution, supplies a useful arrangement of existing material. Work with counters precedes exercises with figures; the simpler arithmetical operations are placed before the more complex; and drill and practice are insisted upon. In another work, *Ein gerechent Büchlein auff den Schäffel, Eimer und Pfundt gewicht* (1533), Riese gives a number of tables for ready reckoning and the *Annaberger Brodordnung*, giving the fluctuations in the weight of bread according to the fluctuations in the price of wheat.

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RIGHT-HANDEDNESS. — See Ambidexterity.

RIGHTS OF CHILDREN. — See Childhood, Legislation for Conservation of; Pupils, Rights and Duties of.

RING LAYING. — See Kindergarten.

RINTELN, UNIVERSITY OF, PRUSSIA. — Established shortly after the beginning of the Thirty Years' War (1621) by Count Ernest of Schaumburg. It was one of several Protestant institutions founded at the beginning of the seventeenth century in Germany, for most of which the University of Wittenberg served as a model. The institution never attained any special prominence, and was closed by the government of Westphalia on Dec. 10, 1809, being absorbed by the University of Marburg (*q.v.*). R. T., Jr.

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RIO DE JANEIRO, FACULTY OF MEDICINE, SURGERY, AND PHARMACY. — See Brazil, Education in.

RIPLEY, GEORGE (1802–1880). — Founder of the Brook Farm Institute of Education and Agriculture (afterwards incorporated into the Brook Farm Phalanx); was graduated from Harvard College in 1823 and from the Cambridge Divinity School in 1826. He was tutor at Harvard for a year and then continued his studies in Europe. He engaged for a time in the ministry; and in 1841 he began the Brook Farm experiment. Two hundred acres of land were purchased at Roxbury (near Boston). The aim of the association was "to establish an agricultural, literary, and scientific college, where a pure religious and moral life could be lived." After the failure of the experiment (1846), Mr. Ripley engaged in teaching on Long Island. He was editor of the *American Cyclopædia;* coeditor with Charles A. Dana of the *New American Cyclopædia,* and joint author with Bayard Taylor of *Handbook of Literature and Fine Arts.* W. S. M.

RIPON COLLEGE, RIPON, WIS. — A coeducational institution incorporated Jan. 29, 1851. No college classes were formed until the autumn of 1863, when the Rev. William E. Merriman was elected to the presidency, and the college grew rapidly and substantially. The administration of Edward H. Merrill, D.D., LL.D., began in 1876, and continued until 1891. Rufus Cushman Flagg, D.D., was president from 1892 to 1900; Richard Cecil Hughes, D.D., from 1901 to 1909; Silas Evans, A.M., D.D., 1910. The entrance requirements to the College are fifteen units of high school work. The college courses lead to the degrees of A.B. and A.M. Special preparation is given for teachers and for entrance to the professional studies of law and theology. A school of music is also maintained. The faculty in 1910–1911 consisted of twenty-six members, and the student enrollment was 230. S. E.

RITES AND CEREMONIES. — See Primitive Society, Education in; Indians, Native Education of.

RITSCHL, FRIEDRICH (1806–1876). — Classical scholar and philologian, born in Thüringen, and educated at Erfurt, Wittenberg, Leipzig, and Halle. His earliest interests and contributions were mainly in Greek literature and antiquities. He taught at Halle (1865–1876). His best known work is an edition of Plautus, with commentaries based on the famous Ambrosian palimpsest at Milan; nine plays appeared between 1848 and 1854, other plays being edited by his pupils. His studies of Plautus led him into researches on the history of the Latin language and inscriptions, of which he made a collection (*Priscæ Latinitatis monumenta epigraphica,* 1862). Further studies and papers deal with the laws of Saturnian verse, the works of Varro, the recent history of classical philology, and the modern pronunciation of Latin, etc. Ritschl was a successful teacher and trained a number of scholars who continued his work.

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RITTER, KARL (1779–1859). — The founder of modern geography, born in Quedlinburg in the present province of Saxony. At an early age he lost his father and was carefully educated by his mother, a women of rare intelligence and character, with the help of the well-known educator, Guths Muths (*q.v.*). In 1784, when Salzmann (*q.v.*) founded the famous educational institution of Schnepfenthal, he accepted the talented boy as one of his first pupils. Guths Muths at the same time entered the institution as a teacher, and continued to direct Ritter's education until the latter, in 1796, entered the University of Halle to prepare for the teaching profession. Ritter very early showed a great interest in geography, and had the good fortune to have his interest stimulated by the instruction of Guths Muths, who taught this science in accordance with the ideas of Rousseau and of the Philanthropinists. After spending three semesters at the University of Halle, Ritter became the tutor of the sons of the Frankfort banker, Bethmann-Hollweg. With his pupils he traveled through Switzerland, France, and Italy. In 1807 he spent several weeks with Pestalozzi at Yverdun, and in the same year he met the great naturalist and traveler, Alexander von Humboldt. From 1813 to 1819 he lived in Göttingen, where his pupils (one of whom later became the Prussian Minister of Education) attended the University. There he produced his great work *Die Erdkunde im Verhältnis zur Natur und zur Geschichte des Menschen* (*Geography in relation to nature and to the history of man*, 2 vols., Berlin, 1817–1818), which attracted general attention and procured for him the professorship of geography at the University and the War College of Berlin. He entered upon this work in 1820, and from then until the time of his death he remained active in the teaching and the promotion of geographical science. His scientific productions, most of which appeared in the *Proceedings* of the Berlin Academy of Sciences and of the Geographical Society, the latter founded by himself, were vast and comprehensive, but his chief influence was exerted through his lectures. Ritter's great service to geography consisted in his new conception of the science as the connecting link between the sciences of nature and the sciences of man. He showed how the study of history must rest on that of geography, and the great attention paid to physical geography in our schools to-day is due to his influence. In America his ideas have been made familiar through the writings of Guyot (*q.v.*) and his successors. Among his works must first be mentioned the second edition of his *Erdkunde* (1822–1858), the first volume of which treated of Africa. The work was, however, expanded to such an enormous degree that in spite of the appearance of eighteen more volumes it remained a torso, only the different countries of Asia being treated. Parts of it, such as the geography of Palestine, have been translated into English by W. L. Gage (London, 1867).

Of particular pedagogic interest are his *Letters on Pestalozzi's Method, applied to Scientific Education* (1807) and *Some Remarks on a Methodical Instruction in Geography* (1806). The latter of these shows how early Ritter formulated that clear conception of the nature of geography which he kept throughout his life. His lectures on the *History of Geography and of Discoveries*, on *General Geography*, and on *Europe* were published after his death. In honor of his memory two "Karl-Ritter-Foundations," one at Berlin and one at Leipzig, have been founded. Their object is the promotion of geographical knowledge through aid given to explorers and scientific investigators. F. M.

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RITTERAKADEMIEN. — See Academies, Courtly; Gentry and Nobles, Education of.

RIVALRY, RETINAL. — A phenomenon of binocular vision. When an object not too far from the eyes is fixated, the right eye receives a slightly different impression from that of the left, due to the different positions of the eyes in the head. If, then, as in the stereoscope, any images so differing are simultaneously thrown on the foveæ of the two eyes respectively, they will combine into an impression like that of the original object. This is called stereoscopic vision. If, however, the two images are very different (as, for instance, a red and a blue circle or a series of vertical and one of horizontal lines) so that they do not normally combine into any single familiar object, first one of the images will be seen and then the other; that is, instead of binocular retinal fusion, there is a binocular retinal rivalry. The rhythm with which the rivalry proceeds and the length of time that either image persists are determined by a variety of factors, such as the relative intensity of the impressions, their relative complexity, etc. It is probable that the immediate physiological cause of the change from one image to the other is inadvertent eye movements. R. P. A.

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RIVALRY. — See Emulation; Punishments and Rewards.

RIVERS, RICHARD HENDERSON (1814–1894). — College president; was graduated from La Grange College, Alabama, 1835. He was professor at La Grange College from 1835 to 1843 and president of the college from 1854 to 1865. From 1848 to 1854 he was president of Centenary College, Louisiana. His publications include *Mental Philosophy* (1860), *Moral Philosophy* (1866), and *Our Young People* (1880). W. S. M.

ROANOKE COLLEGE, SALEM, VA. — An institution for men established in 1853 and since then continuing its work without intermission. In addition to the regular college work a business course is conducted. The entrance requirements are fifteen units of high school work. The last two years of the college course, which leads to the A.B. degree, is arranged in five groups. The M.A. degree is also conferred by the college. The enrollment of collegiate students in 1911–1912 was 197; the faculty consists of nineteen members. J. A. M.

ROBERT COLLEGE, CONSTANTINOPLE, TURKEY. — An institution for the higher education of the native races of the Turkish Empire. The idea of its foundation was conceived by Dr. Cyrus Hamlin, D.D., LL.D. (*q.v.*), who interested Christopher R. Robert of New York in 1860. The two raised funds to which Mr. Robert contributed largely and the college was opened in a rented house at Bebek on the Bosphorus in 1863. In 1864 the trustees of Robert College of Constantinople were incorporated in the state of New York and the College became a part of the University of the State of New York. Official recognition was given to the College by an Irade granted in 1869 by the Sultan. In 1871 it was moved to its present site on the heights of Roumeli Hissar. The aim of the founders of the College was " a model Christian College, in which the first object is the development of Christian manliness in the students through the cultivation of the spiritual as well as the intellectual life." Preparatory and collegiate departments are maintained. Pupils are admitted to the preparatory department at the age of ten and to the subfreshman class of the collegiate department at fourteen. The usual courses, with English as the medium of instruction, are given and lead to the A.B. and B.S. degrees. The students are drawn from the whole of Eastern Europe and represent fifteen nationalities. Robert College has educated about 3000 students since its foundation, and has an annual enrollment of about 350 students. There is a faculty of thirty-six members.

See MISSIONS, EDUCATIONAL ASPECT OF MODERN.

ROBINSON, HORATIO NELSON (1806–1867). — Textbook author; studied at Princeton; was instructor of mathematics at the United States Naval Academy (1825–1835); author of *Elementary Algebra* (1846), *University Algebra* (1847), *Astronomy* (1849), *Geometry and Trigonometry* (1850), *Mathematical Operations* (1854), *Analytical Geometry* (1864), and several works on arithmetic.
W. S. M.

ROCHESTER THEOLOGICAL SEMINARY, ROCHESTER, N.Y. — Founded by the Baptist denomination in 1850 to train young men for the Christian ministry. The regular course of three years covers the literature of Old and New Testaments in Hebrew, Greek and English, systematic theology, church history, Christian ethics and pastoral theology, homiletics, elocution and sacred oratory. Courses are given in church music and in religious pedagogy. An extensive elective system adds about forty courses to those of the prescribed curriculum. Practically all students are college graduates. A German department, established in 1852, furnishes elementary as well as more advanced instruction, in a course of six years. Rev. Augustus H. Strong, D.D., LL.D., completed forty years of service as president, in May, 1912. At present there are fifteen men on the two faculties. The material assets are beyond two million dollars, of which $1,700,000 are productive. The students number about 150 annually. J. W. A. S.

ROCHESTER, UNIVERSITY OF, ROCHESTER, N.Y. — Was founded in 1850. Its establishment was the result of two different movements, a local demand for an unsectarian college, and an attempt to remove to Rochester the Baptist college at Hamilton, N.Y., now Colgate University. The removal plan was thwarted by the advocates of a strictly denominational education. Thereupon leading citizens of Rochester secured from the legislature a new charter to replace the charter of 1846, which had been permitted to lapse during the removal controversy, and elected a board of trustees. Instruction was begun in November, 1850. Although the college owed its existence largely to the efforts and gifts of Baptist clergymen and laymen, its charter prescribed no denominational test for trustees or professors. The progressive policy of its founders was further shown in the remarkable " Plan of Instruction," which was about twenty years in advance of current ideas in its emphasis upon modern languages, science, and a limited election of studies during the latter half of the course. The University of Rochester maintains only courses leading to the degrees of bachelor of arts and bachelor of science. Its first president (1853–1888) was Martin Brewer Anderson, an educator of commanding personality. He was succeeded by David Jayne Hill (1888–1896), later Ambassador to Germany, and Rush

Rhees (1900). The college has a campus of twenty-four acres, nine buildings, including new laboratories for pure and applied science, a library of 60,000 volumes, and excellent museums of geology and mineralogy and zoölogy; the buildings and grounds are valued at $870,000 and the productive endowment at $942,000. The faculty numbers thirty-four and the students (1912) 427, of whom 161 are women. J. R. S.

ROCHOW, FRIEDRICH EBERHARD VON (1734–1805). — German nobleman and educator, the son of a Prussian Minister of State, educated privately and at the *Ritterakademie* at Brandenburg. In 1749 he entered the army with which he remained until 1757, when he retired to Leipzig. Here, through the friendship of Gellert, the poet, he continued his education in many fields, and became interested in the chief philosophical movements of the period. In the following year he decided to take up the administration of his estate at Rekahn and was thus brought into immediate contact with the material and spiritual needs of the country people. These were particularly emphasized in 1771 and 1772, when the countryside was devastated by disease and famine. After some thought, Rochow determined that the only solution must come through the schools, and in 1772 he wrote *Versuch eines Schulbuches für Kinder der Landleute zum Gebrauch in Dorfschulen* (*An Attempt at a Schoolbook for Children of the Country People for the Use of Village Schools*) in which he pleads for better educated and better paid teachers. Rochow was a strong advocate of the catechetical method of instruction and introduced it into all the schools on his estates. He established schools at Rekahn, Gettin, Krahne, and other villages, and rebuilt the school at Rekahn. To this school he appointed in 1772 Heinrich Julius Bruns, who had been in his household as musician and secretary, and was now organist and choirmaster at Halberstadt Cathedral. The two, taking turns as teacher and pupil, elaborated the catechetical method and acquired considerable facility in its use. The principles discovered were embodied in *Instruktion für die Landschullehrer* (*Manual for Country School-teachers*, 1773). The school soon acquired fame through the untiring energy of Bruns and was visited by more than 1000 persons until 1787. Rochow attempted to secure government aid for his schools in order to abolish fees and increase the salaries of his teachers. He secured a small grant which was of some assistance. In 1773 he published a reader (*Bauernfreund*), which was sold on his estates by an invalid soldier. This work was expanded and published in 1776 as the *Kinderfreund*, one of the earliest children's readers, which quickly went through four editions of 100,000 copies, and twelve unauthorized editions, and was translated into a number of foreign tongues. A second part appeared in 1778. The curriculum in his schools went beyond the three R's and included singing, nature study, object teaching, and religious instruction. Although strongly religious, Rochow was no believer in religious formalism and frequently emphasized the social importance of religious instruction. He insisted in the classroom on an appeal to intelligence, and, when possible, to sense-perception, and for that reason believed in the catechetical method, which allowed the pupil as well as the teacher to ask questions, as opposed to learning by rote. In 1779 he wrote the *Handbuch der katechetischen Form für Lehrer die aufklären wollen und dürfen* (*Manual of catechetical method for Teachers who wish and should enlighten*), — a plea for enlightenment of the lower classes as well as a work on aim and method. Rochow was a prolific writer on educational subjects and was keenly alive to the educational questions of his day. He was a friend and supporter (for a time) of Basedow (*q.v.*) and sent some boys from his estate to Dessau to be trained for teaching. He was in correspondence with Baron Von Zedlitz, the Minister of State. He was a strong influence in advancing the movement for the training of teachers and took an active and personal interest in the *Seminar* established by the Cathedral Chapter at Halberstadt. He recognized that national progress depended on the schools and the schools on able teachers, and so far was he from intrusting the education of children to the church that he held that "children belong to the state; it is the will of the state that they be educated and learn to read, write, cipher, and to think properly." To this end he wrote, in 1779, *Verbesserung des Nationalcharakters durch Volksschulen* (*Improvement of National Character through the Public Schools*), and in 1792 translated Mirabeau's *Discourse on National Education*. In 1795 he wrote a *History of my Schools* (*Geschichte meiner Schulen*). Rochow's influence was for a time extensive and marked an era in the provision of education for the countryside. It declined, however, before the rapid and widespreading influence of Pestalozzi for whose ideas Rochow had prepared his country.

See BASEDOW, JOHANN BERNHARD; PHILANTHROPINISM; LITERATURE, CHILDREN'S.

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ROCK HILL COLLEGE, ELLICOTT CITY, MD. — A school of the Christian Brothers (*q.v.*), founded in 1857 by the purchase of Rock Hill Academy, a private institution opened as early as 1800, and by the removal of a school, Calvert Hall, maintained by the Brothers in Baltimore from 1843. The academy was incorporated as Rock Hill Institute in 1862 and as Rock Hill College in 1865. The most noted of the presidents has been Brother Azarias (see MULLANY, PATRICK FRANCIS).

See CHRISTIAN BROTHERS.

ROCKEFELLER, JOHN D., GIFT TO GENERAL EDUCATION BOARD. — See GENERAL EDUCATION BOARD; see also CHICAGO, UNIVERSITY OF.

ROCKFORD COLLEGE, ROCKFORD, ILL. — Founded in 1849 to provide for the higher education of young women. The collegiate course of study was not added to the Seminary curriculum until 1882. In 1891 the Seminary course was discontinued, and in 1892 the name of the institution was changed from Rockford Seminary to Rockford College. Beginning with the class of 1896, all graduates of the institution have been college graduates. In 1909, the preparatory department was discontinued. Courses in home economics, secretarial work, and teaching have been introduced. These may occupy about one fifth of the entire time devoted to college work. The present enrollment is between two and three hundred students. The total number of baccalaureate graduates is about four hundred. Many among them are prominent as teachers, missionaries, lawyers, editors, and physicians, among the most prominent being Miss Jane Addams of Hull House. The faculty numbers thirty-two. The college courses lead to the degrees of A.B. and B.S., respectively. Each represents four years of preparatory study, corresponding to the high school course, and the four years of collegiate study. Rockford College is the only woman's college between New York State and California accorded the first rank in scholarship by the United States Commissioner of Education, and, with the exception of Mount Holyoke (*q.v.*), stands as the oldest of these colleges. J. H. G.

ROEBUCK, JOHN ARTHUR (1801–1879). — English politician, born in India and educated in Canada. In 1831 he was called to the English bar. In 1832 he became Member of Parliament for Bath and proved a strong progressive in politics. In education his advocacy of a national scheme of education in 1833 is noteworthy. He attacked the problem from the point of view of the growing democracy and in the interests of good government. "I wish them (the people) to be enlightened in order that they may use the power well which they will inevitably obtain." He recommended the appointment of a high state official, a member of the Cabinet, to take charge of the system which he proposed. The country was to be divided into school districts with their own school committees. School attendance was to be compulsory for all children between the ages of six and twelve. Two types of schools were to be established — infant schools to teach the three R's, and schools of industry to give general instruction and special trade preparation. Importance was to be attached to the teaching of those subjects which provide the means of enjoyment. "Education means not merely these necessary means or instruments for the acquiring of knowledge, but it means also training or fashioning the intellectual and moral qualities of the individual, that he may be able and willing to acquire knowledge, and to turn it to its right use." In the towns evening and Sunday continuation schools might be provided for those who wished to attend. Finally, normal schools would be necessary to train teachers for the schools. The cost of education and maintenance of schools was to be provided out of tuition paid by those who could afford it and from a general tax. Roebuck was largely inspired by acquaintance with contemporary changes in French education and Victor Cousin's report on Prussian schools. A national system of education was not established in England at the time, but it may be that the first education grant was an indirect result of Roebuck's appeal. Roebuck was always an advocate of secular schools and both in 1833 and 1843 expressed himself to that effect in Parliament. Roebuck remained in close connection with Bath until he was rejected as its member in 1847. In 1849 he became member for Sheffield, with which, excepting a brief interval, he was connected until his death. His attention was, however, given up mainly to questions of foreign politics.

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ROGERS, JOHN (1631–1684). — Fifth president of Harvard College; was graduated from Harvard in 1649. He was assistant pastor at Ipswich, Mass., "but at length his inclination to the study of physic withdrew his attention from theology." He was president of Harvard from 1682 to his death in 1684. W. S. M.

See HARVARD UNIVERSITY.

ROGERS, WILLIAM BARTON (1804–1882). — First president of the Massachusetts Institute of Technology; was graduated from William and Mary College in 1822. He was instructor at William and Mary for three years and for three years principal of schools at Windsor, Md. From 1828 to 1835 he was professor at William and Mary College and from 1835 to 1853 at the University of Virginia. He was lecturer at Lowell Institute in 1856 and 1857, and organized the Massachusetts Institute of Technology in 1865 and was its president until 1870. He was the author of many scientific works. W. S. M.

See Massachusetts Institute of Technology.

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ROLL OF HONOR. — See College, American, under Administration of the College Curriculum; Jesus, Society of, Educational Work of; Punishments and Rewards.

ROLLAND D'ERCEVILLE, BARTHÉLEMY (1734–1794). — French statesman, advocate, and parliamentarian. Although not primarily interested in education, his *Compte-rendu*, presented to the Parliament of Paris in 1768, was a real treatise on that subject. The expulsion of the Jesuits (*q.v.*) from control of their various institutions of learning in France had wrought havoc in the teaching force of the secondary schools all over the land. This parliamentary report was in part intended to meet this situation, but incidentally it discussed many fundamental educational questions. He pleaded for a more extensive study of history, especially in its national aspects; he insisted that the study of the native language should be as dignified as that of Latin; he wanted special teachers of the mathematical and physical sciences appointed, instead of intrusting this scientific instruction to the philosophers; and he demanded universal education, at least to the extent of reading and writing, and the adaptation of instruction to the needs of the various classes. On the administrative side he proposed the establishment of a normal school for the preparation of teachers; and he suggested the highly centralized scheme of educational control that was adopted by Napoleon in his organization of the Imperial University in 1808. Aside from the *Compte-rendu*, cited above, should be mentioned his *Recueil de plusieurs ouvrages sur l'éducation* (1783); *Plan d'éducation* (1784); *Recherches sur les prérogatives des dames chez les Gaulois* (1787). F. E. F.

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ROLLIN, CHARLES (1661–1741). — French historian and educator. He is a striking instance of a poor boy who forced his way up from the bottom. Although at one time a menial in the Collège du Plessis, he later rose to be a master in the college when only twenty-two years of age. He was professor in the Collège de France from 1688 to 1736, was three times chosen rector of the University of Paris, 1694, 1695, and 1720, and was head of the Collège de Beauvais from 1699 to 1712. Here he performed his most telling work, raising this institution from a very lowly to a high position among the university colleges. He instituted important reforms in the curriculum, infusing modern ideas into the study of history, and he was a leader in the movement to replace Latin by the vernacular. Although long accustomed to write in the classical language, he set the example by writing thenceforth in French, no fewer than twenty volumes issuing subsequently from his pen. While his *Histoire ancienne* (13 vols., Paris, 1730–1738) is his most famous work, yet to the student of education his *Traité des études* (1726–1728) is far more important, especially in view of the light it throws upon the educational conditions in the Paris colleges of his day. Among his more important works are: *Histoire ancienne*; *Histoire romaine*, 16 vols., volumes 8–16 being continued by Crevier (Paris, 1748); *Œuvres complètes*, edited by Letronne (30 vols., Paris, 1821–1830). F. E. F.

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ROLLINS COLLEGE, WINTER PARK, FLA. — Established by the Congregational Association of the state, in 1885, but entirely undenominational in spirit and control. There are eight departments: the college, the academy, and the schools of music, expression, fine arts, domestic and industrial arts, teaching, and business. It has a campus of twenty-five acres, twelve buildings, twenty instructors, about two hundred students, and nearly one quarter million dollars of endowment. Its standards of admission and graduation are the same as those of the classical colleges of New England and the West.

ROMAN CATHOLIC CHURCH AND THE PUBLIC AND PAROCHIAL SCHOOLS. — For the historic relation of the church to education in the past see a great variety of topics, especially Church Schools; Bishops' Schools; articles on the Church Fathers; Canon Law and Education, Abbey Schools, Christian Education in the Early Church; Middle Ages, Education in; Monastic Education; and the articles on the various Monastic Orders, *e.g.* Benedictines, Dominicans, Franciscans, Jesuits, etc. For the contemporary relation of the Church to education see the articles on the various national systems, RELIGIOUS EDUCATION, etc. The article on CONVENT SCHOOLS gives a survey of existing systems of the various monastic teaching orders. For the legal aspect of religious education in the schools of the United States, see BIBLE IN THE SCHOOLS. The following articles deal only with the present-day aspects of the problem.

In the course of its development, American public education has steadily divested itself of specifically religious elements, and become more secular in character. The general view is that this has not been due to growth of irreligion, but to the same causes which made government nonsectarian in character. The variety of denominations has made it necessary to have public education, like public administration of other sorts, confine itself to functions not subject to partisan dispute. Prayers, catechetical exercises, and Bible readings have tended to disappear from the activities of the public schools (see BIBLE IN THE SCHOOLS), though the atmosphere, owing to the character of the teachers, has remained distinctly moral and even religious in a broad sense of that word.

The supporters of the public school, therefore, have fostered its development for secular studies. They have contended that in the teaching of reading, writing, history, literature, geography, mathematics, and manual arts, there need be no sectarian or religious element; that if the teachers were morally upright and earnest, the total effect upon the child would be good. They felt that if the school claimed the child for only 200 days of five hours each per year, it was entirely possible for the various churches to procure suitable religious training in the remaining time. Rarely have the supporters of the public school been opposed to religious teaching as such; they have recognized the difficulty, if not impossibility, of giving it under public school conditions, and have, therefore, sought to have public school time reserved for studies about which there was no dispute.

But many religious people, and conspicuously the Roman Catholics, have claimed that education is essentially a unitary process, incapable of subdivision as above indicated.

This question has been the subject of public controversy in the past, and is of current importance in European countries. A few years ago it became a subject of great practical importance in Wisconsin, Minnesota, and in Manitoba (see MANITOBA SCHOOL CASE). It is possible that the question may be one demanding public attention in the future. So many supporters of the exclusive public system of education are so uninformed concerning either the principles or the activities of the chief supporters of the parochial school idea, that it is desirable to have both a clear formulation of positions upon which this advocacy is based and a summary of present attainments. P. M.

See also LUTHERAN CHURCH AND EDUCATION.

Present Position of Roman Catholic Church and Schools. — The Catholic church has always maintained the religious principle in education. Her charter as a teaching institution is clearly laid down in the words of Christ to His Apostles: "Going therefore, teach ye all nations — and behold I am with you all days, even to the consummation of the world," Matt., xxviii. 19, 20. While this divine commission refers primarily to the doctrine of salvation, and therefore to the imparting of religious truth, it nevertheless, or rather from the very nature of that truth and its consequences for life, carries with it the obligation of insisting on certain principles and maintaining certain characteristics which have a direct and decisive bearing on all educational problems. The Catholic church consistently holds that life here gets its highest value by serving as a preparation for the life to come. She insists that no education is complete which leaves out of consideration the ultimate purpose of life, and hence that no education is "a preparation for complete living" which ignores or sets aside that ultimate purpose. It is just this completeness — in teaching, in harmonizing all truth, in elevating all human relationships, in leading the individual soul back to the Creator — that forms the essential characteristic of Christianity as an educational influence. The Catholic church has laid down these principles: (1) intellectual education must not be separated from moral and religious training. To impart knowledge or to develop mental efficiency without building up moral character is not only contrary to psychological law, but is also fatal to both the individual and society. No amount of intellectual attainment or culture, she holds, can serve as a substitute for virtue. (2) Religion should be an essential part of education; for on it morality is based; with the Catholic church the maxim prevails: "no religion, no morality; no morality, no government;" hence religious instruction should form not merely an adjunct to teaching in other subjects, but should be the center about which these are grouped and the spirit by which they are permeated. Sound moral instruction, she holds, is impossible apart from religious education. Such training furnishes the strongest motives for conduct and the noblest ideals for imitation, while it sets before the mind an adequate sanction in the holiness and justice of God. Such an education, which unites the intellectual, moral, and religious elements, is the best safeguard for the individual and the most effectual preparation for citizenship and the discharge of social duties. According to the Catholic view the welfare of the state demands that the child should be trained in the practice of virtue and religion no less than in the pursuit of knowledge.

The Catholic church has always laid down and followed these vital principles of education. She has laid them down not only for the elementary schools, but for the higher schools — the colleges and universities. She has never wavered; she has never receded, and she never will; and that because of the view she holds of education. For education, she maintains, is the formation of the whole man — intellect, heart, will, character, mind, and soul. Whether it be the child of the artisan in the parish school or the son of the millionaire in the university, it is all the same. She will accept as education nothing less than the formation of the whole man. She will never consent that her children shall be reared without the knowledge of her faith, or that education shall be so divorced that secular knowledge shall be made the subject of daily and earnest inculcation and that religion shall be left out as an accident, to be picked up when and as it may. The Catholic church holds that a Christian nation can spring only from Christian schools, and that neither private zeal, nor home education, nor the Sunday school suffice to supply the Christian teaching and formation of character which she desires in her children. It is because of this settled conviction that at all costs and at great sacrifices she preserves here in the United States the unbroken and unimpaired tradition of Christian education from the parish school of the humble mission to the numerous colleges and universities that she has established throughout the country.

When the Catholic bishops of the United States met in the third plenary council of Baltimore, in 1884, one of the most important questions they had to discuss and legislate upon was the subject of parish schools. Laws and regulations for the establishment and management of these schools were laid down with great care and definiteness. In every parish, where it was possible, a school was to be established. Catholic parents were directed to send their children to these schools. The local rector was urged, as well as the teachers, to make these schools equal to the best. Courses of studies were prescribed; a school superintendent was to be appointed in each diocese; local school boards of competent laymen were to be selected; in fact nothing was to be left undone to effect a thorough organization of the whole parish school system. The rapid growth, the educational strength, and the marked success of the parish schools date from this decided action of the Catholic hierarchy. As a result of this action of the Catholic bishops to-day there are over one million and a half children receiving their education in over five thousand Catholic free parish schools in the United States. This great educational work is carried on without any financial aid from the state. The parish schools are maintained by the voluntary contributions of Catholics. For the Christian education of their children, Catholics are making tremendous sacrifices that elicit the praise of all thoughtful Americans; and at the same time they are saving to non-Catholic taxpayers a vast sum, estimated from $30,000,000 to $35,000,000 annually, for this is what it would cost the taxpayer if the children now being educated in the Catholic schools had to be provided for in the public schools.

The Catholic parish school system is now so thoroughly organized and equipped, its efficiency as tested by practical results so well established, that few hesitate to acknowledge that it is doing a great educational work. The Catholic parish school is not an experiment; it is an assured success, and it has come to stay. There was a time when it was thought by some that the parish school could not live beside the public school. The latter had the attractions of fine buildings, ample playgrounds, well-paid teachers, all that public money so generously provided by the state could provide, while the former had, up to within recent years, poor buildings, little if any playgrounds, and scant means for carrying on its work. The success of the parish school is largely due to the devotion and self-sacrifice of the thousands of religious women and men — the members of teaching orders of the church — who have consecrated their lives to Christian education. To these is due the present excellent condition of the free Catholic parish schools; without them it would be almost impossible for the system to succeed. To-day the network of parish schools extends into every state and territory and is under the guidance of the Catholic bishops and the local clergy.

From the beginning the Catholic church has had parish schools in the United States. It is interesting to note that six years before the establishment of a public school in New York there was a Catholic parish school, St. Peter's, Barclay Street, in that city. Earlier still, in the middle of the eighteenth century, there were Catholic schools in Pennsylvania. In 1781 in Philadelphia an old schoolhouse and lot were bought from the Quakers, and opened as a Catholic parish school in August, 1782. In the early days, however, these schools were few and rather poorly equipped. The buildings were not attractive and oftentimes unsuitable for school purposes. The schools were not well graded. There was a lack of teachers in those early days, for the numerous teaching communities of religious men and women were not yet widely established in this country. There was also in certain quarters a disposition on the part of some parents to ignore the directions of the church and to send their children to the public school. There was besides a strong popular feeling against the parish school on the ground that it was "un-American." Notwithstanding these difficulties — the hampered means of the church and her people, the popular outcry against these schools, and the dissatisfaction here and there of some Catholics — the parish school system went on extending itself into every diocese and almost every parish in the country. To-day no Catholic parish is regarded as adequately equipped that has not a school and a course of study equal to the best. As a result of the insistence of the church to provide schools and perfect the system of teaching there has been in recent years a wonderful development of Catholic parish schools, academies, colleges, and universities.

In the New England dioceses, especially with the notable increase of the Catholic population in recent years, there has been a rapid growth in the number of parish schools; also in the dioceses of the Middle Atlantic States and in the newly formed dioceses of the West the development within a very short time has been very pronounced. Within the last thirty years in the dioceses of New England Catholic educational institutions have multiplied threefold. In the archdiocese of Boston the Catholic schools equal in number those which were flourishing in the entire province a quarter of a century ago, while the number of children in the parish schools, colleges, and academies of the archdiocese of Boston far surpass the total attendance of the Catholic schools of all New England twenty-five years ago. In the archdiocese of Philadelphia the same marked growth of parish schools is to be observed. In 1869 there were forty-two (42) parish achools, with an enrollment of 15,232 pupils, while last year there were one hundred and forty-one schools, with an attendance of over 65,000 pupils. The same steady growth can be witnessed in almost every diocese throughout the country.

The Catholic population is increasing rapidly, — it numbers to-day over fifteen millions, — and it will tax the energies of the church to provide additional school accommodations proportionate to this increase. Free textbooks and the like in the public school accentuate the ever acute realization of the financial problem. Yet, in view of that which has been done, no one doubts that the loyal and self-sacrificing generosity of the people will be equal to the solution of these and other problems that will arise in continuing and completing the work of Catholic education. The single fact that the parish schools have over a million and a half pupils — almost one half of the Catholic children of elementary school age in the country — is splendid evidence of the solid growth of the educational system, as well as strong testimony to the spirit of zeal and self-sacrifice on the part of both clergy and laity that has made such a result possible. Here it may be observed that the growth of the church's secondary schools has kept pace with that of the elementary schools.

School Buildings. — In the matter of buildings and school equipment the Catholic parish school is to-day generally up to all modern requirements. The school authorities fully recognize the necessity and importance of properly constructed buildings, and in their construction have paid due attention to all that is required to make them both healthful and attractive. The average Catholic rector fully understands that children are affected by their environment and that of necessity much of their time is to be spent in the schoolroom. Hence, he gives this subject much thought and attention and usually employs a competent architect. As a consequence we find almost everywhere, especially in the cities, substantial and oftentimes imposing parish school buildings, classrooms well-designed and so arranged as to give the best results as to seating, lighting, hygienic and sanitary arrangements, with the necessary halls, cloakrooms, etc. These buildings are usually of stone or brick, and compare favorably with the public buildings in the same place. The classrooms are provided with the latest style of desk and ample blackboard space. The ventilation, heating, and lighting are found to be, in most of the schools, all that could be desired. Many of the parish schools have also ample playgrounds. Nothing has thus been left undone in a material way to make the parish schoolhouse an inviting place for the pupil. The cost incurred is oftentimes very great, running anywhere from ten thousand to one hundred and even as high as two hundred thousand dollars for a single building.

Administration. — The management of the parish school rests ultimately with the rector of the parish. He is usually aided by a local committee or school board made up of competent laymen who are interested in educational matters. The council of Baltimore suggested the appointment of such a body, and it has been found by experience that its services are most helpful. The members of the school committee visit the schools regularly, at least once a week; they inspect the building, are present at recitations, usually question the pupils, and in many other ways contribute to the efficiency of the school The gentlemen who are selected for this position regard it as a special mark of honor and give their time and services cheerfully. They are a great aid to the pastor in his school work. They meet, usually once a month, in conference with the rector, when the daily workings of the school are discussed and suggestions made for remedying any defects or for bettering conditions.

Where the school attendance is large — over 300 or more pupils — there is generally a principal appointed from the teachers in charge to supervise the daily work, to look after the discipline of the pupils, and to report to the rector the more serious violations of rule. It is the duty of the principal to see that the work in the various grades is properly done, to aid and direct younger teachers, and to supply the place of a teacher who may be temporarily absent because of illness or some other cause. The principal makes out the weekly and monthly reports which are sent to the rector and the parents of each pupil.

In most dioceses there is a diocesan superintendent who supervises all the schools of the diocese. He is a priest who is well up in educational matters and is set apart by the bishop for this work. He is relieved from the usual parish work and devotes his whole time to the supervision of all the schools in the diocese. He makes regular visits and holds examinations at stated times. He publishes annually a full and detailed report of the parish schools of the diocese, giving the standing of each school. No one can examine these annual reports without being convinced that the diocesan superintendent has been a powerful factor in the great progress made of recent years in these schools.

Teachers. — The teachers in the parish schools are for the most part members of the various teaching orders of men and women who have consecrated their lives to the work. Many lay teachers are found in the German, Polish, Italian, and Slavish schools, as well as in the parish schools conducted in small towns or rural districts where it is not possible to maintain a religious community. The parish school-teacher devotes his or her whole life to teaching. And thus the religious teacher has, in this respect, a decided advantage over those teachers who occupy themselves with the important duties of teaching until something more lucrative or attractive is found. The child's future is always the first and great consideration with these religious teachers. No one is admitted to undertake the responsibilities of a teacher who is not fully qualified for the work.

There are examining boards in every diocese to test the qualifications of teachers. The Church authorities strongly insist that teachers must thoroughly understand the art and science of education; that no teacher be employed who is not duly qualified. Teachers are required to secure certificates of proficiency either from diocesan school boards or from Normal or Regent examiners so that the public may know that none but competent teachers are employed in the schools. To fit such teachers, normal schools exist in most, if not all, the religious teaching communities. The Catholic idea of the ideal teacher is one in whom moral character, intellectual training, and professional skill coöperate in harmonious action for the success of the class and of the individual pupil; one who day by day becomes the better teacher precisely because day by day he or she becomes a more diligent student, a more successful solver of the pedagogical or psychological problems that present themselves within the realm of the classroom. To secure such ideal teachers, or at least to make the combination of necessary qualities less rare, is the end aimed at in normal school training. The religious teaching communities justly claim to have been the first to establish normal schools for teachers, though from some of the histories of education, or from the data advanced by lecturers in schools of pedagogy, one would never be led to suspect the fact.

Teachers' institutes are generally held during the summer vacation and are conducted by men and women distinguished in their different branches of knowledge. They are specialists in the subjects with which they deal. The general nature of the work done in these institutes is along the lines of methods of teaching the common subjects usually taught in elementary schools. Not less than two and usually four or five instructors are sent to each institute. The work has been eminently successful, and has been approved by the bishops of the various dioceses in which it has been carried on. It has been found very beneficial to the school and helpful to the teachers.

Besides, there is held an annual educational conference of the leaders in elementary and secondary schools where the whole educational field is covered and discussed by Catholic men and women who have given their lives to the work of education.

The methods of the Catholic schools are not the methods of the public schools. The Jesuits, the great teaching order of the Church, have their methods bequeathed to them from the sixteenth century, when they captured the whole civilized world by the brilliancy of their teaching; the sisterhoods have their methods modeled after the constitution that Peter Fourier drafted for them in the last years of the same century; the Christian Brotherhoods have their methods as laid down by one of the most eminent educational geniuses of the seventeenth century, Saint John Baptist de la Salle (*q.v.*). The Catholic University at Washington has within the past year opened a summer school and institute of pedagogy with hundreds of teachers in attendance at its first session. The instruction treats of the history of education, the principles and methods of education, psychology, American and general history, and literary work. There are a number of Catholic educational periodicals and reviews, besides a growing list of books specially prepared to aid teachers in their work.

General Principles. — From what has been written the position of the Catholic church on this vital subject of education is plain. She holds firmly that religious and secular education cannot be divorced but must go together in order that the future citizen may be properly trained to discharge his duties to his fellow man and to God. In the studies pursued in her schools, while she aims to make her children good, conscientious Christians, she does not forget to instruct them in the history of the country, the origin and principles of its government, and the eminent men who have served it by their statesmanship and defended it by their valor; she instructs them in civic rights and duties and thus contributes to the making of enlightened, useful citizens, sincere and devoted patriots. The right of the church to establish and maintain her own system of schools, provided always that they be in conformity with the just and legitimate requirements of the State, has never been restricted by either state or national law. Liberty of education is an established fact in America. The true spirit of all American legislation has ever tended to protect the rights of minorities and to guarantee the absolute equality before the law of every citizen, no matter how he may differ from others in his religious or political belief. Here it may be said that Catholic citizens complain of the injustice that is being done them inasmuch as they are educating a million and a half of children in their parish schools and are taxed at the same time to support the public schools, from which they receive no benefit. But this very hardship has only served to place in a clearer light their self-sacrifice and practical loyalty to the principles on which Catholic education is based. It may be well also to note that it is not true that Catholics are opposed to the public school system as such. Their contention is that an education divorced from religious teaching is not complete or adequate. Therefore, as this essential is lacking in the school system supplied by the state, they feel bound in conscience to provide one of their own in which religion will find its proper place. Their hope is that in time their fellow citizens will, in justice, allow them out of the public taxes levied for educational purposes such proportion for results as their free schools show and as is the custom in Germany, Canada, England, and elsewhere.

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ROMAN CATHOLICS AND ENGLISH EDUCATION. — See Dissenters and Education.

ROMAN EDUCATION, ANCIENT. — The education of the Romans is interesting principally as the direct link of connection between the civilization of ancient Greece and that of the modern western world. It was profoundly affected, however, by the practical virtues and capacities of the Roman nation. Moreover, Rome as a small city state had one kind of education, Rome as mistress of the world another. The former was indigenous, the latter Hellenic; the former simple, traditional, domestic, and moral; the latter intellectual, literary, and philosophical.

Early Roman Education. — The early period appears to have been as fully dominated by custom, by the idea of *mos majorum*, as is usual in communities of the smaller and more primitive type. The principal duty and necessity of a small organized society that is surrounded by powerful and hostile neighbors is to look to its own preservation, to maintain unchanged the qualities that have made its existence possible, and to train its sons in military as well as industrial efficiency. This then was the aim of the early Roman state. In practice, the arbiter of the education of children was identical with the arbiter of their lives and possessions, the father, whose authority (*patria potestas*) was absolute, even to the point of selling a family into slavery. It is not the less clear that the right of the old Roman law did not represent the customary attitude of a Roman father to his children; in fact, he left them in their earlier years to be brought up at the mother's knee. In the sturdy half military, half agricultural atmosphere of the old Roman family the boy was trained in obedience, seriousness, reverence, frugality, industry, and military courage. Father and mother were alike apt to be hard and severe. They were scrupulous in observing and teaching to their children the rites and ceremonies proper to each religious occasion; but they seldom appear to have manifested the Greek instinct for the ideal, the beautiful, or the imaginative side of life. Their offerings and rites were principally directed to the preservation of the household, the fruition of the crops, or the safety of the city. The father, or occasionally the mother, frequently taught the sons to read, write, and calculate money; and the more aspiring households made provision for the repetition of old heroic stories to the young, allowed the boys to be present at the reception of clients in the early morning and the festive banquets in the evening or even to attend the senate house in company with their fathers. Training in the use of arms must have been always obligatory on the Roman youth; and Plutarch remarks that Cato would not leave this or any part of his son's upbringing to a slave.

Throughout the early Roman period the power of the father is the primary feature of education, extending to exposure of the recently born infant or to slavery. But the conception of right among the Romans was correlative with that of duty, and it was the father's care to inculcate the standard moral virtues, *constantia* or firmness, *virtus* or fortitude, prudence, simplicity, *gravitas* or dignity, patriotism, punctiliousness in due observances and regard for law. There were certainly few schools prior to the period of direct Greek influence; there may not have been any. It is true, there are legends of Romulus and Remus going to school, and Virginia is represented as a school pupil, but it would be far-fetched to reason from the tales of the past that were current in Livy's sophisticated era to the actual conditions of a more primitive age. It appears probable, however, that from a very early period in the history of the republic there were schools near the forum, and that not only reading and writing but the laws of the Twelve Tables were a part of the recognized curriculum of these schools. An indication of deliberate moral training by means of legendary or historical examples is found by some in the large body of didactic biographical stories which survived from republican to imperial times.

It would also seem that a minimum of cultural and literary knowledge was expected of Roman boys prior to the period of Greek influence, since they were required to learn by heart the Laws of the Twelve Tables. These laws, adopted 451–450 B.C., were esteemed by Cicero to surpass the libraries of all the philosophers, both in weight of authority and wealth of utility (*De Oratore*, I. 44). The extensive fragments of the Twelve Tables which have been collected by the industry of modern scholars reveal the litigious character of the Romans, their practical genius, their scrupulous piety, and one may add their lack of idealism. The laws prescribed the mode of procedure in connection with a summons before the magistrate, judicial proceedings, execution for debt, the rights of the father, inheritance and tutelage, dominion and possession, real property, torts, public law, sacred law, and certain supplementary matters.

Græco-Roman Education. — This is the name which might well be applied to the system of instruction that one finds in Rome in the later days of the Republic and under the Empire. Even by the middle of the third century B.C., the tide of Greek influence was so strong that Roman diplomatists could speak Greek, and books written in Greek at Rome could find readers. Greeks who had been brought to Rome as slaves were transformed by the merit of intellect and culture into teachers. In 146 B.C. Greece became a Roman province, and this date may be regarded as marking, as well as any other, the moment of the conclusive triumph of Hellenic culture over Roman militarism. But at the beginning of the second century the Greek puns and jests of Plautus were already intelligible to a Roman audience, and Greek slaves were already employed as *litteratores* or teachers of reading and writing. The principal school text employed by the early Græco-Roman teachers was a Latin translation of the *Odyssey* made about 250 B.C. by an emancipated slave, Livius Andronicus, the father of Roman Hellenism. Latin translations and imitations of Greek plays were also used in the schools, while the study of the Laws of the Twelve Tables was retained at least until the age of Cicero. The more ambitious teachers who ventured into the field of literature, including Greek as well as Latin in their curriculum, were distinguished from the *litteratores* by the title *grammatici*, and may be regarded as secondary rather than primary teachers. Indeed, by the fourth century A.D. a *grammaticus* was a professor of university rank. The title appears to have been first claimed by the Greek Praxiphanes of Rhodes about 300 B.C.

Plutarch remarks that the earliest Roman teacher to open a regular school with prescribed fees was Spurius Carvilius, who flourished about 230 B.C. It is probable that education, where it had not been the task of a household slave, had previously been compensated by free-will offerings. The first serious teaching of grammar in Rome is attributed by Suetonius to Crates of Mallos (*q.v.*).

The most advanced type of education, however, to which one finds repeated reference in Roman literature was conducted either in the schools of the philosophers or in those of the *rhetores*. Considerable opposition was manifested against philosophy. One hears of the banishment of two Epicurean philosophers from Rome about the middle of the second century B.C., and of the Latin philosophers and rhetors in 161 B.C. The schools of the philosophers were probably of the informal and private character which they had traditionally assumed among the Greeks; but those of the rhetors appear to have adopted regular textbooks and to have gradually standardized an elaborate curriculum. Public speaking was one of the main roads to preferment in Rome, and Cato included a book on the art of speaking among the texts to be studied by his son. Cicero's book *De Oratore*, and afterwards Quintilian's *Institutes*, furnished materials for discussion and study by the most advanced pupils. It is true that rhetorical instruction at Rome was formal in character; it is true that its principles were not lofty, nor its rules inspiring; but it equipped men like Cicero and Cæsar for their labors and successes. It was not an education intended for the majority of Roman citizens, but for those only who aspired to public honors. A few of the chairs of rhetoric in Rome were endowed by the emperors, Quintilian's being the first, and certain professorships at Athens appear to have been similarly favored. But the life of a teacher is repeatedly declared to have been laborious and ill remunerated; and although the offices of *grammaticus* and *rhetor* came to be regarded with some honor, the lower grades of the profession were never highly esteemed. There was, however, a steady tendency for the *literator* to aspire to the work of a *grammaticus* and the *grammaticus* to that of the *rhetor*.

In the field of physical education the theories of the Romans were radically opposed to those of the Greeks. The chief end of the Roman exercises was war, although riding, swimming, hunting, and even quoit-playing, shared the popularity of the pursuit of dexterity in arms. The emphasis on beauty and grace, so characteristic of Hellenic life, was unacceptable to the Roman *gravitas*, and even antithetical to the Roman conception of virtue. " She played and danced more gracefully than is necessary for a virtuous woman," says Sallust of Sempronia. The Greek practice of the naked wrestling of youths in the palæstra, the Hellenic fondness for the flute and the lyre, the performances of citizens upon the stage, and the practice of public dancing were as earnestly condemned by the conservative Romans as they were ardently championed by the admirers of Hellas. The first palæstra in Rome appears to have been that which is recorded to have been built by Nero. The traditional Roman *gravitas* associated every form of entertainment with the duty of a slave or the surroundings of vice.

Oratory, more than any other study, occupied the attention of the talented Roman youth. In politics, jurisprudence, or war, oratorical skill was equally indispensable. A manual of oratory is ascribed to the elder Cato. In the words of Livy, some were carried forward to the highest offices by jurisprudence, others by eloquence, others by military glory. Oratory then was recognized in the Republic and earlier Empire as a highroad to advancement and fame. Cicero regretted that whereas for the Greeks it had been an end in itself, for the Romans it was but a means to success at the bar. The youths trained in oratorical schools would begin to speak in the forum at eighteen or nineteen years of age, at times making their début in a funeral oration. From the time of the elder Cato it became customary for speakers to write down and publish their orations which had previously been delivered without notes. The speeches of Cicero, Quintilian, and others were taken down by clerks, probably in shorthand, and published with or without the consent of the author, sometimes in garbled versions. Under these conditions the study of rhetoric in Rome was anything but the perfunctory occupation that it seems to be at the present time. It was a practical and profitable thing, frowned upon by the old-fashioned censors (who decreed the expulsion of the rhetors from Rome in 92 B.C.), but welcomed by the ambitious youth. One reads that only four years after the decree above cited, a freedman of Pompey, one Vultacilius Plotus, skilled in Latin rhetoric, had opened a school in the city. There were also numerous teachers of Greek and Asiatic oratory in Rome during and subsequent to the age of Cicero.

Under the Empire oratory became less genuine and more servile. Forced to renounce serious topics, the schools became the center of a host of fictions. The ancients had been orators, the moderns were but rhetoricians; at least, such was the judgment of Tacitus. The Empire was never so sure of maintaining a check upon freedom of speech as after it had begun to pay the salaries of eminent professors of rhetoric, the first being Quintilian himself in the reign of Vespasian. Gaul and Africa in the third century became important centers of rhetorical study, Gaul being signalized by the skill of her professors in the manipulation of forms of style; Africa by the energy of her rhetors, including Tertullian, Arnobius, Cyprian and Augustine, in the defense of Christianity.

When a pupil had completed his task under the *grammaticus*, he went naturally to the school of the *rhetor*, where his work began with demonstrations, and proceeded to declamations, deliberations, and controversies. Controversies included case law, the subdivision of the subject, and the appeal to mitigating circumstances. But the cases cited in the schools were strangely unreal. Pliny, Petronius, Tacitus, and others ridicule the questions that were customarily raised and disputed, dealing with tyrants, or pirates, or the sacrifice of maidens. Contemporary politics were practically tabooed. It was the opinion of Petronius that such instruction made youths into fools. Little realism was attached even to historical debates about Sulla and Hannibal; none at all to declamations on subjects taken from Vergil, Ovid, or Homer. But the same stereotyped empty fictions continued to be treated in the time of Ausonius, the same in the days of Augustine, the same even as late as the sixth century. The subjects appointed for prose composition were no more vital than topics of debate. In particular, among the favorite exercises of the schools was the composition of fictitious letters; for example, an advanced pupil would be called upon to write a letter from Cicero to Cæsar, or from Seneca to the Apostle Paul.

Other subjects of study in the Roman schools require no more than a cursory reference. Arithmetic was taught in the schools, as is indicated by Horace, but we know little of what was done in the subject in his day, although there are some indications that the decimal system of notation may have been taught much earlier than has been supposed. No advance was made upon the knowledge formerly possessed by the Greeks in arithmetic and geometry, which suffered in the estimation of scholars by their supposed alliance with astrology. The Romans were by no means the equals of the Alexandrian Greeks in mathematical attainments. Neither did they study natural history at first hand, but only from Greek texts, which were gradually corrupted and confused by the introduction of superstitious auguries and credulous allegories and fables.

The study of agriculture flourished among the Romans, but in a private and individual way, and by means of books rather than schools. Medicine was a purely Greek art, although under the later Empire the Arabic physicians had already begun to dispute the palm with the Greeks; this art also depended upon books and individual instruction, but not schools. The same general status is characteristic of architecture and military science. Geography, music, and astronomy were actually taught in school, but only in the first of these subjects did the Romans show any originality or tendency to add to the sum of human knowledge. The measurement of land, however, was so important from a legal and military point of view that special schools of surveying were established under the Empire, the first impulse having been given by Cæsar, who summoned Greek teachers in this field from Alexandria to Rome.

Organization. — Roman schools were private undertakings; and it is probable that at all times the children of the more opulent classes received their elementary instruction, not at school, but through a tutor at home. Livy refers to the existence of schools in the bookshops (presumably near the bookshops) in the Forum at the time that the ministers of Appius Claudius offered violence to Virginia, who was a daughter of the people. Horace refers with contempt to the hedge-schools of his day, which were such that his father had refused to send him to the school at Venusium, but had brought him for better instruction to Rome. Quintilian indeed discusses the question whether instruction is better given at home or at school, and decides in favor of the latter, but his reference throughout is to secondary rather than elementary studies. Frequently one paterfamilias would employ a Grecian grammarian and admit the children of neighbors to his instruction, as did Cato, who is reported to have also personally superintended the education of his son. Quintilian says that Greek was commonly taught before Latin. Each boy was accompanied to and from school by a slave or *pedagogus*, each girl by a nurse; and pedagogues and nurses remained during the period of instruction. Thus Augustus set aside reserved seats for boys of noble birth in the theater, and next to them seats for the pedagogues.

Elementary Schools. — These were conducted by masters known as *ludimagistri*, *literatores*, or sometimes in the later period *grammatistæ*. If not at home, it was at these schools that children learned to read and write. It seems that children went to these schools at as early an age as seven, and Horace and Quintilian refer to the devices of kind teachers to make the primary lessons amusing and interesting. Reading was learned by a syllabic method. Writing was practiced on wax tablets; and at first the teacher guided the beginner's hand. Arithmetic appears to have been emphasized more than in Greece, especially counting, which was practiced both with the fingers and the abacus (*q.v.*). In most of the elementary schools there was but one teacher, who was, however, frequently assisted by a subordinate or even a pupil teacher. Apparently the teachers of elementary schools were socially despised; indeed so many slaves and freedmen were employed as teachers that this could not have been otherwise. Punishment was frequent and severe, and was generally inflicted with a ferule, though there are references also to the use of whips furnished with leather thongs. The Stoics in particular defended corporal punishment; a fact which would be significant even if one had not the evidence of Menander that "the man who has not been flogged is not trained." It does not seem certain whether the ordinary schools were attended by girls as well as boys, but there are indications that this may have been the case. As to the school building, it was generally a sort of porch with a roof, but no sides, though curtains appear to have been used on occasion. The pupils sat on wooden benches, the teacher on a *cathedra*, or raised chair; desks appear to have been omitted from the furniture. On the other hand, the walls were frequently hung with pictures and tablets, and perhaps ornamented with maps and busts of celebrities. Horace mentions eight *asses* — about eight cents — as the monthly fee of the elementary school at Venusium. Holidays extended to from three to seven days at the *Saturnalia*, and five days on the *Quinquatriæ* in March; and it seems probable that a summer vacation of four months was allowed in the elementary (but probably not in the higher) schools, extending from the Ides of June to the Ides of October. On the *Nundinæ*, the market days, which came every eighth day, there was apparently a regular whole or partial holiday; and Rome was greatly given to extraordinary festivals of a religious or public character, such as must surely have been observed in the schools. The schools opened, however, at daybreak, sometimes even earlier. In the days of Ausonius the customary length of a school day was six hours.

Grammar Schools. — Education of a secondary character was given in private institutions in which a master instructed boys who had already learned the elements at home or under the *literator*. The literary character which instruction had assumed among the Greeks continued to predominate in the imperial era. Greek was frequently taught before Latin;

and the principal textbooks were the works of Greek poets, especially Homer. The elements of rhetoric were frequently taught in the schools of the *grammatici*, but there was a growing disposition to reserve this study for a still more advanced type of school, that of the rhetor. But Roman masterpieces, and especially the works of Cicero, were studied, and Æsop's *Fables* were regularly employed as mental exercises. Rules of grammar, extracts from literature, the Twelve Tables and doubtless other standard formulæ of knowledge were learned by heart. It was a customary thing for the *grammaticus* to teach the calendar and other necessary tables through ingeniously constructed rhymes. (See Grammar Schools.)

Rhetorical and Philosophical Schools. — These two types of schools were sometimes connected so as to form loosely organized universities, as at Rome and Bordeaux. The students at these schools were frequently but not always of an age to wear the *toga virilis*. The students of rhetoric practiced first narrative, both in fable and history, then criticism, and finally the construction and delivery of panegyrics and philippics. Argumentative topics, some practical, many absurd or at least irrelevant to practice, were also discussed, and imaginary legal disputations furnished another favorite exercise. The pupils were frequently taught in classes, but these classes were usually conducted by the same master, one class studying while another recited. After graduating from a Roman rhetorical school, ambitious students frequently went abroad to study at Greek universities, especially those of Athens and Alexandria. The change of toga, which introduced a Roman youth to a freer and less constrained mode of life, usually occurred at fifteen years or shortly afterward, but this act was wholly in the control of the father. Full citizenship appears to have been assumed at about the age of twenty, after a year of probation in which the young man was expected to discharge certain prescribed exercises in the Campus Martius and otherwise to make ready for the assumption of the full responsibilities of adult Roman life.

Many of the later emperors manifested a profound interest in higher education. Augustus, when he expelled foreigners from Rome, exempted the teachers of the liberal arts. Vespasian actually endowed the chairs of Greek and Latin rhetoricians with an annual payment of 100,000 sesterces, but this endowment must have been restricted to a few. Quintilian is the first professor known to have received an endowment. Hadrian, Antoninus Pius, and Severus appear to have been distinctly liberal towards the cause of learning. A kind of scholarship is mentioned by which the children of the poor were granted a gratuitous supply of corn and a free education. Five thousand children are said by Pliny to have been thus supported by Trajan. Constantine granted a number of exemptions and privileges to public teachers; Julian prohibited Christians from teaching and exercised a censorship over appointees; and Gratian fixed the salaries of professors, providing that a public teacher of rhetoric should receive twice the salary of a teacher of grammar, while at Trèves, the temporary capital, salaries were to be highest. The late Roman period appears to have been marked indeed by considerable devotion to study, even to the extent of critical research; but education at the same time appears to have been lacking in any principle of progress or originality.

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See Endowments; Grammar Schools.

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ROMANCE LANGUAGES — FRENCH, SPANISH, ITALIAN. — See Modern Languages in Education.

ROME, UNIVERSITY OF, ITALY. — The *studium urbis*, or university of the city, as distinguished from the *studium sacri palatii*, was established in 1303 by Pope Boniface III as a *studium generale*, with an emphasis on arts and law. In 1318 the right of the University was limited to granting degrees in canon and civil law. The institution continued during the schism, but decayed rapidly, probably in large measure because of the absence of democratic control prevalent at other Italian universities. It was reorganized, however, under Pope Eugenius IV, who is regarded as the second founder, in 1431. The Roman municipality also made grants of money. But in spite of the efforts of a number of succeeding popes, the progress was very slow. Leo X laid the foundations for new buildings, completed under Sixtus V, extended the *Sapienza*, a building erected under Alexander VI, and united the *studium urbis* with the *studium sacri palatii.* The latter was a university attached to the Papal Court for the study of law. It was founded in 1244–1245 and was attended largely by priests and beneficed clergy. Theology, philosophy, and medicine were added later. In 1311–1312, under the direction of the Council of Vienne, professorships in Greek, Arabic, Chaldee, and Hebrew were established to train missionaries for the Orient. A peculiarity of this university was the fact that it was migratory and moved with the Papal Court. The disturbed condition of Rome during the sixteenth century retarded further progress. And, indeed, the institution never passed beyond very modest limits until the nationalization of Italy. After 1870, the government devoted its attentions to the questions of higher education. The faculties of the University are as follows: law; medicine and surgery; physical, mathematical, and natural science; philosophy and letters. The following schools and courses are also maintained: engineering; pharmacy; archæology; medieval and modern art; oriental studies; agriculture; and education. The enrollment in 1910–1911 was 3816 matriculated students and sixty-six auditors.

See Italy, Education in.

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ROOF PLAYGROUNDS. — See Architecture, School; Playgrounds.

ROOTS. — See Powers.

ROSCELLINUS (*c.* 1050–1122). — An eleventh century scholastic philosopher. He was born in lower Brittany about the year 1050. After studying at Soissons and at Rheims he became Canon of the Church of Compiègne and taught successively at Compiègne, Besançon, and Tours. In 1094 he was condemned by a Council held at Soissons, the charge being his heretical doctrine in regard to the Trinity. After a brief sojourn in England he returned to France, resumed his teaching, and had many distinguished men, including Abélard, among his pupils. He died about the year 1122. Roscelin was a Nominalist. He maintained that the universal is neither a concept nor a reality, but only a name. The phrase, however, that the universal is merely "the breath of the voice" (*flatus vocis*) is very probably the expression of an opponent, not Roscellinus' own. He was also suspected of sensism, or the doctrine that the mind has no power superior to the senses. In his advocacy of dialectic he incurred the distrust of the mystics, who accused him of rationalism.

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ROSE POLYTECHNIC INSTITUTE, TERRE HAUTE, IND. — See Technical Education.

ROSENKRANZ, JOHANN KARL FRIEDRICH (1805–1879). — A German philosopher, born at Magdeburg. He studied at the universities of Berlin, Heidelberg, and Halle, and began his long career as a university teacher in 1831. Two years later he was called to the University of Königsberg to occupy the chair of philosophy, which had been made famous by Kant and Herbart. He filled this post until his death. The incumbency of these three philosophers in this professorship extended over a century. For a time Rosenkranz was influenced by Schleiermacher, but later became one of the most important disciples of Hegel (*q.v.*). Although at one time he sought to make some modification of the master's system, he did not swerve to either "wing," but formed a part of the "center." His unusual activity as teacher and author was directed to an application of the Hegelian method and principles to education, history, literature, theology, and philosophy. Among his writings may be mentioned *History of German Poetry in the Middle Ages* (1830), *Psychology* (1837), *History of the Kantian Philosophy* (1842), *Studies* (1839–1848), *Life of Hegel* (1844), *Æsthetics of the Ugly* (1853), *Science of the Logical Idea* (1858–1859), and *Hegel as Germany's National Philosopher* (1870, translated into English by G. Stanley Hall).

The masterpiece in the literature of the philosophy of education is Rosenkranz's *Die Pädagogik als System* (1848). A translation of it by Anna C. Brackett appeared under the title, *Pedagogics as a System*, reprinted from the *Journal of Speculative Philosophy* (1872–1874). It appeared in a revised form in 1886 as *The Philosophy of Education*, being the first volume of the International Education Series (New York), edited by William T. Harris (*q.v.*). In his application of the philosophy of Hegel to the problems of education, Rosenkranz so formulated his grasp upon the theoretical, practical, and historical material as to have practically determined the course of serious reflection in this field since his time.

What is the final meaning of education? Can this meaning explain the educational practices of the present as well as of the past? Taking a philosophical view of psychology and the history of civilization, Rosenkranz finds constructive answers to these questions by placing education in its universal relations. It is considered in its general idea, in its special elements, and in its particular systems. Man's real nature consists in his relation to his ideal, and education is the process of developing this true nature both in individuals and in nations. Our animal nature must be suppressed, an accomplishment of the process of self-estrangement (*Selbst-Entfremdung*). This is a dialectical process of looking beyond the usual to the strange and foreign things in life, only later to find one's self in a higher stage of self-appreciation. Education is possible only to self-active beings, such as human minds are. The form and limits of the process are consequent upon its nature. In its special elements, education includes physical, intellectual, and volitional training. The explanation of work, play, habit, and the stages of the formation of the higher faculties out of the lower, are elaborated similarly. The social elements in the process are clearly recognized by the enumeration of the fivefold system of institutions which contribute to the process: family, school, citizenship, vocation, and church. "Education is the preparation for life in institutions." The number of pedagogical principles is limited to a few ideas, and therefore there cannot arise many particular systems of national education. The third part of the *System*, by presenting a synthetic and appreciative survey of national types of schools and educational aims, has contributed permanently to the study of this historic material. The broad development of education has been through the forms of national, theocratic, and humanitarian types. The highest form is the education of the state, which "must furnish a preparation for the unfettered activity of self-conscious humanity." E. F. B.

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ROSMINI-SERBATI, ANTONIO (1797–1855). — One of the most important persons in modern Italian philosophy, was born at Rovereto and died at Stresa, Italy. He belonged to an old noble family, and inherited its fortune at the age of twenty-three. Before reaching his majority he had determined to devote himself to philosophy and to the service of the priesthood of the Roman Catholic Church. He founded, and contributed largely to, a new religious order, the Institute of Charity (sometimes known as Rosminians), comprising the Brothers of Charity, which received Papal sanction in 1839, and the Daughters of Charity, or Sisters of Providence. Through its branches, which spread into Italy, Switzerland, France, Great Britain, and America, the order added to its work of charity the maintenance of elementary schools, Sunday schools, and asylums, including provision for the training of teachers. He lived, at various times, in devoted service to the Church and to humanity, at Rovereto, Milan, Rome, Domodossola, Trent, and Stresa, patiently enduring much opposition and persecution. Early discovering his philosophical interest, he labored to perfect this into a complete system. The idea of being is objective, fundamental, and enters into all acquired knowledge. Being and truth are convertible terms. This comes to us as an intuition and not as a judgment, and is therefore free from all error. Perception gives us true external existence and reflection yields full specific ideas. Mind develops further by advancing to abstract ideas or principles of science. On such psychological grounds, he attempted a system of philosophy that should be a final cyclopedia of knowledge. By giving new form and new vigor to conceptions already known, he extended the influence of philosophy in southern Europe through his zeal to unite rationalism and the faith of revelation. He wrote *New Essays on the Origin of Ideas* (1828–1830), *Principles of Moral Science* (1831), *The Five Wounds of the Church* (1832, published 1848).

During the last years of his life Rosmini exerted great influence on educational thought and practice, especially in Italy. In 1839 he began his chief educational work, *The Ruling Principle of Method Applied to Education.* This treatise was planned to include three volumes; but the fragment published posthumously (1857) includes only six sections. He consciously used his philosophy as a basis for education. Psychology and anthropology present the manner of action of human faculties; ideology and ethics state the objects which are to stimulate the mind in order to educate it aright, while ontology and theology exhibit the ends which human development is to realize in rest and satisfaction as the goal of all life. Education must find "the invariable law of the progress (of the human mind) and the natural scale of thought by which it ascends. The law must hold good for all intellects alike, because it is intrinsic to the human mind. The scale must be the same for all minds, great or small, without a single step being omitted by any, although some minds will go faster and some slower." The "law" becomes a proper gradation of objects. "A thought is what serves as matter or supplies the matter for another thought" (Davidson). The practice of education, or method, must therefore be guided by the development of knowledge through the successive periods of life, which are functionally characterized by the degrees of cognition attained. In analyzing this development, Rosmini recognizes five periods up to the seventh year of childhood, and traces the natural continuity in the four "orders of cognition" appearing up to this time. They include simple perceptions, abstract mental images, judgment and comparison, instructive and appreciative volitions, and the beginnings of the moral sense. In this effort he worked with Herbart and Froebel, but independently, in laying the basis of modern education, and anticipates, in form, at least, modern genetic psychology. His views exerted considerable influence upon Thomas Davidson (*q.v.*). He also wrote *Unity of Education*, *Liberty of Teaching*, and a *Catechism arranged in accordance with the Idealogical Order*.

E. F. B.

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ROSS, GEORGE E. — See Canada.

ROSSALL SCHOOL, ENGLAND. — See Grammar Schools; Public Schools.

ROSTOCK, GRAND DUCAL MECKLENBURG-SCHWERIN UNIVERSITY OF. — A university in Germany, which, although to-day the smallest in point of attendance, is one of the very oldest. It was founded in 1419, the Papal Bull of Martin V being dated February 13, and the formal opening taking place on November 12. Heidelberg and Leipzig (*qq.v.*) are the only existing German universities that take precedence over Rostock in the matter of age. Most of the members of the first faculty hailed from the University of Erfurt (*q.v.*), which had been established in 1392, and which served as a model for the new institution. The University of Rostock was organized as a school of three faculties, the theological faculty not being added until 1432. It soon attained considerable renown and played a prominent rôle in the field of higher learning in north Germanic territory. Before the close of the century, the University was forced, owing to religious and local feuds, to move its location twice, once to Greifswald, and once to Lübeck, and the Reformation brought even more disastrous results in its train, so that by 1527 there were only ten students in attendance. Although the Reformation had secured a firm foothold in Mecklenburg, several members of the faculty clung tenaciously to the old belief, the first outspoken Protestant rector not being installed until 1538. But after the death of the last Catholic rector (Boye), in 1542, the adherents of Luther secured permanent control. A thorough reorganization of the institution was now undertaken, culminating in the new regulations of 1563, which continued in force for almost two hundred years. In accordance with these, the duke and the city each appointed and paid nine professors, the rector being chosen from one group the first semester and from the other group the second. The first rector under this new arrangement was David Chyträus, the leading Lutheran theologian from the second half of the sixteenth century. Various Hanse towns came to the financial aid of the institution at this time, and in 1569 the new main building was erected, the famous "Weiszes Kolleg," which did service for three centuries, being replaced in 1869 by the present structure. As a result of the new order, the institution flourished for almost a century and entered at this time upon the period of its greatest renown, the two hundredth anniversary of its foundation being celebrated in 1619 with much splendor. The institution did not suffer as much during the Thirty Years' War as it had during the Reformation; it was only during the occupation of the city by Wallenstein (1628–1631) that a serious influence upon the attendance was noticeable. Shortly before the war (1614) a public university library had been established. During the latter half of the eighteenth century difficulties arose over the desire of Duke Frederick the Pious to appoint Döderlein, an adherent of pietistic doctrines, to a chair in the theological faculty, and a conflict between the duke and the city magistrates led to the establishment by the former of a new university, that of Bützow, in 1760, the ducal half of the faculty of the University of Rostock being transferred to the new institution. This was a hard blow for Rostock, but it was soon recognized that the small country could not support two institutions of higher learning, and in consequence the University of Bützow was closed in 1789 and merged with the older institution. In 1827 the city relinquished its rights in the administration of the University, which was attended at that time primarily by residents of the duchy. With the erection of the new main building (1869) and of a series of institutes in the years after the Franco-German War, a new impetus was given to the University which was reflected in the student enrollment, the number of students having increased from 164 in 1875 to 1008 during the summer semester of 1911. Of the latter, 920 were matriculated students, of whom 386 were enrolled in philosophy, 384 in medicine (including dentistry and pharmacy), 103 in law, and 47 in theology. The faculty consists of about 75 members, of whom 20 are docents. The annual budget amounts to approximately $275,000. The Grand Duke of Mecklenburg-Schwerin serves as chancellor, the rector being elected annually by the faculty. The library contains 285,000 volumes.

R. T., Jr.

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ROSWITHA (HROSWITHA). — Nun of Gandersheim who lived in the second half of the tenth century. She is noteworthy for her scholarship and knowledge of many of the liberal arts. She wrote a number of poems on religious subjects, legends of the saints, and a panegyric on the Ottos. Her best-known works are seven dramas in prose. These were written in imitation and to take the place of Terence, whose works were regarded as immoral. Roswitha's dramas are short and deal generally with the triumph of virtue over vice, of Christianity over temptations. Much interest was shown in her works during the humanistic revival, when they were edited by Conrad Celtes.

See Convent Schools.

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ROTE, LEARNING BY, AS PUNISHMENT. — See Punishments and Rewards; School Management.

ROTE SINGING AND SONGS. — See Music in Schools.

ROTE WORK. — See Memory.

ROTHSTEIN, HUGO (1810–1865). — German military officer and authority on gymnastics. A man of wide interests and culture, he was attracted during a visit to Sweden in 1843 by the Ling system of gymnastics. An article on the subject came to the notice of King Frederick William IV, who sent him with Lieutenant Techow to Stockholm for a course in gymnastics. In 1846 Rothstein issued the first part of *Das Gymnastik nach dem System des schwedischen Gymnasiarchen, P. H. Ling,* which was completed in 1859. *Das Gymnastik* consists of five parts: (1) Introduction giving an account of Ling, and a discussion of the scope of gymnastics; (2) Educational Gymnastics; (3) Corrective Gymnastics; (4) Offensive Gymnastics (fencing, boxing, etc.); (5) Æsthetic Gymnastics. In the second part Rothstein discusses the educational value of gymnastics, the "art of understanding the importance of physical movements for the all-round, harmonious development of man." The teacher of gymnastics should, accordingly, be familiar with anatomy, physiology, dietetics, etc., and should understand the relation of the physical to the psychical, for the end of gymnastics is to make the body the servant and instrument of the soul. Rothstein was opposed to gymnastic apparatus and for a time secured much support for his views. He objected particularly to the parallel bars (*Barren*), and as director of the *Zentral Turnanstalt* (1857–1863) removed them in 1860 from the gymnasium. Considerable opposition was aroused throughout Prussia and the question (*Barrenstreit*) was taken to the House of Deputies which at first was inclined to support Rothstein. The chief opponent of Rothstein was Du Bois-Reymond and the two continued the controversy even after the former's retirement from activity in 1863, owing to the success of the opposition.

Rothstein also wrote *Bemerkungen über die Gymnastik für das weibliche Geschlecht nebst Anweisungen zum Betrieb desselben* (*Notes on Gymnastics for the female Sex with Remarks on its Conduct,* 1860), in which he advocated in particular free exercise and the total elimination of apparatus for women.

See Gymnastics.

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ROUMANIA, EDUCATION IN. — Roumania is a constitutional monarchy with an area of 50,720 square miles and a population (1909) of 6,865,739. It comprises the former principalities of Wallachia and Moldavia, their union under the present name having been proclaimed Dec. 23, 1861. After the union, Roumania remained subject to Turkey until May 21, 1877, when the representatives of the people, assembled at Bucharest, declared its independence, confirmed by the Congress of Berlin, July 13, 1878. Of the entire population 98 per cent belong to the Orthodox Greek Church which formerly exercised entire control over education. In 1859, two years before the union of the two provinces was proclaimed, the civil government assumed this responsibility. In 1864 a law was passed making primary instruction free in state schools and obligatory for all children, parents being allowed the choice of agencies. More than a decade passed and education became again the subject of discussion and proposed reforms. These were finally embodied, as regards primary education in a law of 1893, and, as regards other departments of education, in a law of 1898.

Administration. — The general control of education is vested in the Minister of Public Instruction, but other ministers have charge of schools pertaining to their special provinces. The Ministry of Public Instruction is organized in three departments: (1) primary instruction, including primary normal schools; (2) commercial, technical, and private schools; (3) secondary and higher education.

The general council, advisory to the Minister, is organized in sections corresponding to the departments named above, and composed of members nominated by their colleagues, but appointed by royal decree for a term of five years. There is also a permanent council of three members chosen by the Minister from the body of university and secondary professors for a term of three years. This council considers only matters pertaining to secondary and higher education. When programs are revised, the director of higher education and the general inspectors must be called to assist the council. There is also a consultative committee which advises the Minister in regard to all matters of public art which come within his province. The business affairs of the system are in charge of special boards constituted as follows: for the service of primary education, the staff of general inspectors and district inspectors; for vocational or technical education, the directors of the respective schools; for secondary education, the general inspectors and directors of schools. The institutions of higher education have charge of their own finances.

There are twenty-three general inspectors under the immediate direction of the Minister, besides special inspectors appointed for music, gymnastics, and drawing, and thirty-three subordinate inspectors or revisors.

Primary Education. — The general direction of primary education rests with the central authorities; but the law imposes upon communal authorities (mayors and councils) the obligation to establish primary schools to the number required. Private primary schools are recognized by law, but are not the subject of special regulation. The ordinary primary schools are for children of the obligatory school age (6–12); attendance upon complementary courses is obligatory up to fourteen years of age. Communes are also authorized to establish higher primary schools where there is a demand for them. Distinction is made between city and rural schools, the course of study for the former covering four years of ten months each, and for the latter five years of nine months each. Agriculture is an obligatory subject for country schools, and each one must be provided with a school garden. The gardens are cultivated by the master and pupils, the product being divided between them, the former receiving 75 per cent and the pupils 25 per cent. In the city schools manual training takes the place of agriculture in the rural schools.

Political conditions have thus far precluded the universal provision of schools; but there is steady progress in both the number of schools and the number of children in attendance upon them, as indicated by the following statistics: —

	Number of Schools			Number of Pupils		
	1864	1897–1898	1907–1908	1864	1897–1898	1907–1908
Rural	1988	3575	4175	23,260	299,083	529,889
Urban	165	392	388			
Total . . .	2153	3967	4563	23,260	299,083	529,889
Per cent of increase . . .		84	15		118	77

Later, though incomplete, statistics show a continuance of progress. For 1909–1910 there were reported 4695 rural schools with 504,297 pupils and 6460 teachers; and 379 urban schools with 80,656 pupils and 7784 teachers. The entire attendance had increased by 10 per cent over that for 1907–1908 and was equivalent to 62.3 per cent of the population of school age, or 8.5 per cent of the entire population.

The increase in the number of schools is due to the policy adopted in 1896 of creating a special fund (*caisse des écoles*) to aid the communes in providing school buildings. The local authorities, mayors, and prefects, are authorized to arrange for loans from these funds to be repaid in installments on easy terms. The control of schoolbooks, their publication and selection, are committed to the Minister of Public Instruction in order to lessen the cost to parents. This is an important item as the complete course of instruction for elementary and higher primary schools is expensive. Besides the elementary branches, the program includes geometry, history of Roumania, geography, natural and physical sciences, hygiene, moral and religious instruction, notions of civil law, drawing, and vocal music, and for rural schools, agriculture. The great importance attached to agriculture is indicated by the provision of farms in connection with country schools which are cultivated by the masters assisted by the older pupils.

Benevolent Institutions. — Roumania is distinguished for the special care given to poor and needy children. Clothing and books are provided for the destitute in order that they may attend school; scholarship funds are maintained in the interests of needy, but promising, pupils; and vacation colonies are provided which afford sickly children opportunity for outdoor life and recreation. The public appropriation for these benevolent works, together with the care of orphans, amounts to 515,000 lei ($103,000) annually. For the public institution for deaf-mutes, accommodating 190 pupils, the appropriation in 1910 was 131,000 lei ($26,000).

Teachers. — The distinction between urban and rural schools is maintained in the classification of teachers. Although the regulations require that teachers shall be specially trained, untrained candidates, who are properly recommended, may be appointed as assistant teachers in small rural schools. These assistants, who are often clerical novitiates, work under the direction of the nearest master or regular teacher, who thus becomes a sort of district supervisor. To be recognized as a full teacher the candidate must be a graduate, and further must have completed two terms of service of three years each, which are terminated by professional examinations. The full appointment carries a life tenure, excepting in case of misconduct. The accused teacher may appeal his cause to the superior council.

Salaries are regulated by grade and length of service. Provisional teachers in rural schools begin with a salary equivalent to $13 a month and receive increases at the rate of 10 per cent at definite periods. Masters of rural schools start at $18 a month and have four increases at the rate of 15 per cent on the current salary. Teachers in cities of less than 30,000 inhabitants receive $38 a month, and in cities of larger populations, $43. Directors of schools are provided with free residence or money equivalent, and all teachers are entitled to extra pay for instruction in special branches, and for services in the classes for adults. The latter are provided for by the education law. Infant schools are encouraged by the government, and a minimum salary is assured to the directors of schools of this order.

Normal Schools. — There are nine normal schools, two for women and seven for men; of the latter, one is maintained by a private society, authorized by the government; the others are all state schools. Candidates are admitted from the age of thirteen to seventeen upon the results of a competitive examination. The course of study covers six years, of which the last is given exclusively to educational theory and practice. The pupils come mainly from the peasant class.

The budget for 1910 carried for primary education a sum equivalent to $2,886,719; of this amount $2,068,149 was for salaries and $569,772 for increases, or altogether 91 per cent for the teaching service.

Technical Education. — A system of technical education under the charge of the Minister of Public Instruction was provided for by a law of 1899, and is being developed as rapidly as circumstances permit. The system comprises: (1) schools of commerce, higher and inferior; (2) schools of arts and trades, classified in three degrees; (3) schools of agriculture and vine culture; (4) schools of household industry for girls; (5) trade schools for girls. The courses of instruction in the lower commercial and trade schools follow directly upon the primary course; courses of the higher order of technical schools are continuous with secondary instruction, care being taken to adapt the practical training to the local demands. In 1910 there were 1431 boys in twelve commercial schools; in 45 schools of arts and trades, 2235; in agricultural schools, 462. In the schools of household economy, 118 girls were registered, and about the same number in trade schools. In addition to the technical schools under the charge of the Minister of Public Instruction there are five technical schools pertaining to the Ministry of Public Works. These are strictly industrial schools, intended to meet the needs of adult workmen.

Secondary and Higher Education. — Since the independence of the province was declared, the Roumanian government has shown chief solicitude for the spread of elementary education and the establishment of technical schools with a view to improving the industrial conditions of the people. Secondary and higher education have a much longer history and retain many evidences of their ecclesiastical origin. Like the Latin Church in Western Europe, the Greek Church in the East has been the patron of the arts and of learning, and has determined courses of instruction, and their final sanctions. Under a law of 1864 the reorganization of secondary education began and was promoted by a later law submitted to the legislature by Minister Haret in 1886, and adopted in 1898. In 1909 and again in 1910 the law was modified in the direction of increasing the modern character of the secondary curriculum.

Organization and Curriculum. — In accordance with these measures, secondary education is organized in two divisions of four years each. The program of the inferior division comprises religion (Orthodox Greek Church, with dispensation for pupils of other faiths), Roumanian language, French, German, and Latin, history (universal, three years, Roumanian, one year); geography, mathematics, physical and natural sciences, hygiene, vocal music, drawing, writing, gymnastics, and military drill. For those students who do not intend to complete the secondary course, a fifth class is added to the lower section, which prepares for industrial or business careers. The higher division is organized in three parallel courses, after the model of the French *lycée*, viz. mathematics and sciences; Latin and Greek; Latin and sciences. As a consequence of this trifurcation the classical course is rapidly disappearing for want of students; at present it exists in nine schools only, out of a total of twenty. The schools offering only the inferior course are termed gymnasia; the higher schools, lycées; both divisions may be comprised in a single institution. Students are admitted to the gymnasium course by examination or by the certificate of primary studies; to the lycée course by the certificate showing completion of the lower secondary. As public secondary education is free there is an open road from the primary school to the highest institutions.

The secondary schools have their independent budgets and are governed by their respective directors, who, as well as the professors, are university men and receive their appointments from the government. In 1910 there were 47 public secondary schools for boys, viz. 20 lycées, 23 gymnasia, and 4 clerical seminaries. They had a total of 873 professors and 14,016 students. The appropriations for secondary education exceed those for any other department, amounting in 1910 to 4,089,341 lei ($817,868). There are ten public secondary schools for girls, which in 1910 had 161 professors and 1615 students. These schools have hitherto followed the programs of the schools for boys; but efforts have recently been made to develop a special program for the girls' lyceés after the French model.

Higher Education. — Roumania has two universities: Bucharest, with five faculties; Jassy, having four. In 1910–1911 the former registered 3422 students, of which number the law faculty claimed 1575. The total included 203 women students. At Jassy in the same year 900 students were registered, of whom 340 were in the faculty of law. Among the auxiliary institutions pertaining to Bucharest are two pedagogical seminaries, a school of veterinary science, and several museums containing important collections. The budget for 1910–1911 carried an appropriation for Bucharest amounting to $361,511 (1,807,558 lei) and for Jassy $129,800 (649,000 lei). Bucharest is also the seat of the state schools of art and architecture.

The most important technical schools are the superior school of agriculture and school of silviculture, under the Minister of Agriculture, the school of roads and bridges under the Minister of Public Works, and the military schools under the Minister of War. There are also important private seminaries intended for the training of priests.

The entire appropriation for higher education through the Ministry of Public Instruction, including universities and special schools, was 2,999,851 lei ($599,970); through other ministries, 1,128,929 lei ($225,785). The clerical seminaries and other private schools under church control derive their support wholly, or in part, from the annual appropriation for the state church. A. T. S.

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ROUNDS, CHARLES COLLINS (1831–1900). — Normal school principal; was graduated from Dartmouth College in 1857. He was for eight years principal of schools at Auburn, Me., and Cleveland, Ohio, and from 1865 to 1893 he was principal of the New Hampshire State Normal School. He was active in the American Institute of Instruction and the National Education Association, and the author of numerous papers on educational subjects. W. S. M.

ROUSSEAU, JEAN JACQUES. — Educational reformer, born at Geneva, June 28, 1712, and died at Ermenoneville, July 2, 1770. He has told the story of his life in three memorable books: the *Confessions*, the *Dialogues*, and the *Reveries*. Studied in their historical places in the order of his writings, and judged in the light of a full knowledge of his genius, his services, his fortunes, his motives, and his own historical place in the world when he wrote them, these three books give us, not only the events of Rousseau's life, but also the parable of his philosophy: the example of a man who, at first instinctively, but afterwards with an earnest sense of moral responsibility, accepted for his guidance through the pleasures, perils, pains, and problems of life, the rulings of the inner law.

Philosophy of Life. — "A man's happiness and virtue," affirmed Rousseau, "are in the right use of his liberty; there is no virtue without effort, the word virtue means essential force. Virtue can belong only to an imperfect being, weak by his infirmity, strong by his will, inspired by the love of goodness. If the spirit of man were compelled to follow virtue, what merit would belong to him for taking his appointed place, in a preëstablished order he had neither wish nor motive for troubling? He would be happy, it is true; but his happiness would lack the moral enjoyment that the love of virtue brings; he would lack the noble interest, the animating desire, to make her his conquest; he would lose the satisfaction of success. He would be perfect, as the angels are; but no doubt a virtuous man is worth more. The supreme happiness for man is in the contentment that follows voluntary obedience to the inner law. To deserve this contentment he exists on the earth, endowed with free choice, tempted by his passions, restrained by conscience." (*Emile*, Bk. IV.)

Rousseau's Life. — Rousseau's life, studied from an exact historical standpoint, divides itself naturally into three periods. First, we have the long preparatory period of thirty-seven years, from 1712 to 1749, when this prophet who was to lead a return to nature in the most artificial age the world has known, and to inaugurate an effort to humanize society in an epoch when civilization seemed to have taught the privileged classes that good society has obligations of its own, emancipating it from the duties and sentiments of common humanity, was trained for this vocation by strange and varied experiences, — by personal knowledge of hardships and happiness; of poverty and freedom; of romance and disappointment; of injustice and sympathy; of the world's cruelty and secret misery; of the indestructible kindness and nobility preserved even in this state of society in many human hearts; and of the profound, unexhausted, and inexhaustible sources of beauty and enjoyment within the soul of man and in nature. Then, secondly, we have from 1749 to 1764 the "prophetic" period; when, as he has himself said, "His heart, kindled with the thought of the future happiness of the human race, and the honor of contributing to it, taught him a language worthy of so great an enterprise." This epoch, when all his great books were written, lasted fifteen years. It ended when, amongst persecutors and secret calumniators, his heart "torn by the spectacle of the hatred" of the Motiers peasantry and by the falling away of some of his most valued friends, he came to believe that his enemies had alienated from him the confidence of his contemporaries; and when he lost the inspiration that had sustained him, with his belief in his power to reach the hearts of his readers to serve them. Thenceforth, we have the third and last period of thirteen years, 1765 to 1778. And now we have to follow the pathetic and heroic effort of the erst brave liberator of others from bondage to conventions and the world's opinions, to liberate himself from bondage to despair; and even at last from the bondage of hope of deliverance from the hatred and contempt of those for whom he had sacrificed the liberty and tranquillity he could never find again. In the *Confessions* and in the *Dialogues* we recognize his courageous effort to maintain his belief in the ultimate triumph of truth and justice. And in the *Reveries* we find that he has escaped even the bondage of this hope; and that he is made free at length, before death, by the conquest of peace and a tranquil spirit.

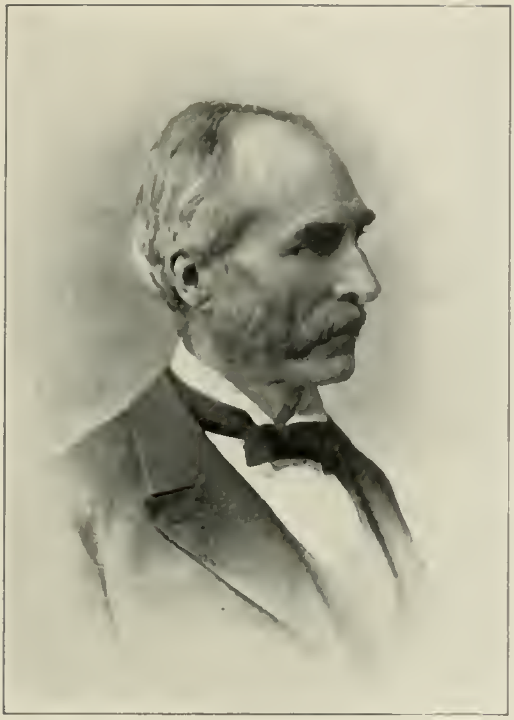
Writings. — The great epoch in Rousseau's life is the period of fifteen years between 1749 and 1764. In this epoch he produced the two *Discourses*, the *Essay upon Political Economy*, the *Letter to d'Alembert*, the *New Heloïse*, the *Social Contract*, *Émile*, the *Letter to Christopher de Beaumont*, and the *Letters from the Mountains*; in brief the whole series of epoch-making books that contained his message to his fellow-men, a message that, as Lord Morley has said, gave Europe a new gospel.

Dealing with different domains of life, all these books have one common purpose: to exhort men to return to nature, to escape from worldly bondage, from routine thinking, to endeavor to see themselves and the true purposes of life as they really are; and then to recognize that the true civilization of the world means to humanize and moralize the outer constitution of things, and all the laws and systems that regulate and control man's outer life, by recognizing and obeying the authority of the inner law. We have this end pursued, first of all, by the negative method of exposing injustices and prejudices hampering man's free obedience to the laws of his own conscience; and then we have the positive method, which seeks the plan of a more reasonable, more beautiful, more humane way of life.

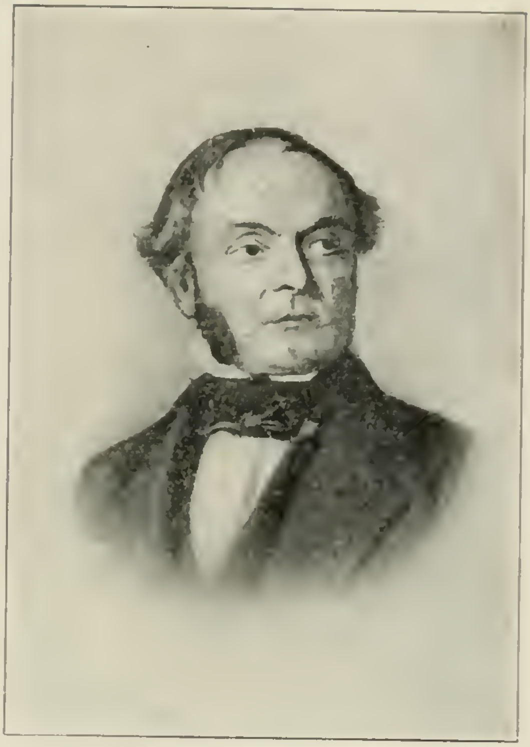
In the two *Discourses* the negative and militant methods prevail. Here Rousseau's effort was to convince his contemporaries that, in spite of artificial adornments and an increased demand for luxuries and physical pleasures, the deterioration of human virtue and happiness is the result of an exclusively selfish and material civilization, which does not foster, but falsifies, where it cannot entirely suppress, those instinctive feelings of humanity, those natural sentiments of moral beauty that within man himself represent the irremovable foundations and natural standards of right desire and noble conduct. In the series of great works which followed the *Discourses* the positive method is employed to discover "some just and sure principle of administration taking men as they are and laws as they might be."

In the *Letter to d'Alembert* and in the *New Heloïse* the problems of social life and of the life of the affections are dealt with. Rousseau inquires what amusements and public ceremonies are harmful or healthful in a republic. He deals with marriage as a sacred and binding tie; with romantic as opposed to sensual love; with family life and the humane relationships between masters and servants; with the consolations and pleasures derived from a country life, with the philosophy drawn from natural religion to inspire and restore the love of virtue; to give piety, resignation, and hope in the hour of death.

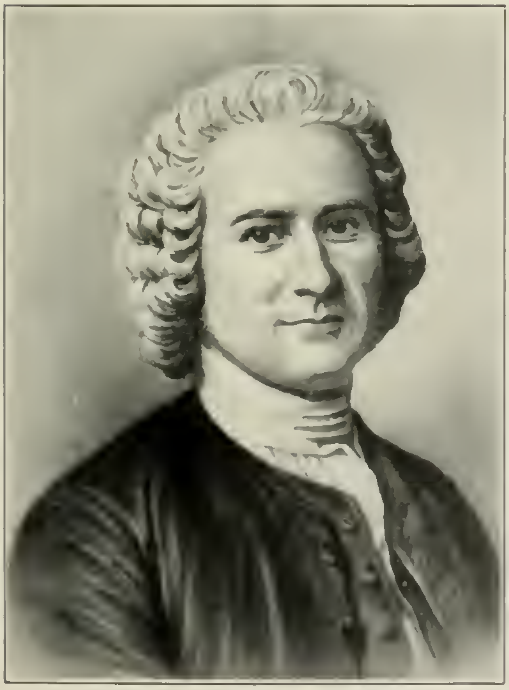
In the *Essay upon Political Economy* and in the *Social Contract* Rousseau seeks to discover a rational moral foundation for civil order where men obtain a more noble freedom than in their natural state, because "to obey the impulsion of physical appetite is slavery: but to obey the law one has prescribed to oneself is liberty;" where also they obtain a moral and legitimate equality, because, "though remaining unequal in strength and genius, men become equal before the law by agreement, and by right;" where also they



Goldwin Smith (1823–1910).
See p. 344.



David Stow (1793–1864).
See p. 426.



Jean Jacques Rousseau (1712–1770).
See p. 211.

Herbert Spencer (1820–1903).
See p. 400.

A Group of Educational Reformers.

arrive at the realization of the social bond of fraternity, by virtue of a compact which "is not a covenant of subjection, but of brotherhood."

Views on Education. — *Émile.* — Finally, in *Émile*, we have traced for the first time the plan of a new education, as the necessary preparation for a new way of understanding life. Here, as elsewhere, it is difficult to-day to do full justice to Rousseau as an original thinker. Ideas that had the appearance of violent paradoxes when he promulgated them have now become familiar to us as the inseparable convictions of an enlightened liberalism. And one hears the ideas professed as necessary conclusions arrived at by natural processes of progress and of a liberal effort to improve and adapt old methods to the altered needs and conditions of modern times. But if by an effort of the imaginative reason we endeavor to exercise those voluntary powers of forgetfulness, so useful to the exact historical student, and deliberately throw ourselves back behind the publication of *Émile*, and take up the authoritative doctrines of education, that Rousseau found in existence, we shall discover that what he attempted, and to a large extent accomplished, by *Émile* was not any improvement in existing methods, but a complete revolution of established theories about the aims, as well as the methods, of a rational education; so that we have quite a new starting point, with the object of attaining a new goal.

Rousseau and Natural Man. — The starting point of every educational theory before Rousseau was the assumed necessity for correcting the original depravity, or stupidity, of the "natural man." And the goal was to transform and refashion this "natural man," in accordance with some one or other of the ideal types, accepted in different times by different schools, as the model of the "well-educated man."

With Rousseau, for the first time, the full and healthy development, not the transformation, of the "natural man" is the purpose of education; and again, with him, also for the first time, the "well-educated man" does not mean the man possessed of special learning; but the man best prepared to meet and master the ordinary conditions and accidents of life. The *Émile*, putting forward those, at that time, entirely paradoxical views not only of the methods but of the purposes of education, was published in 1762; that is to say, twenty-three years before Froebel's birth and at a time when Pestalozzi was just fifteen years old. It is necessary to point this out because the modern fashion is to treat the author of *Émile* as a mere "rhetorician and sentimentalist," and to ignore the solid services he had rendered in the character of a "sower of ideas," a "discoverer of sources." Thus the *Social Contract* is dismissed with sneers; and the promulgation of the doctrine of the "rights of man" attributed to Rousseau's acknowledged disciple, Tom Paine; or else to his confessed debtors, the authors of the American Declaration of Independence. In the same way, Pestalozzi and Froebel are made the original discoverers and inventors of the principles and even of the phrases they received from the author of *Émile*; indeed, the very last fashion is to ignore Pestalozzi as well as Rousseau, and to make Froebel the father and founder of what is called the "New Education," whose principal rule is Rousseau's rule, that the just purpose of education is not to impart learning, but to develop natural faculties by suitable exercises.

By the old theory of education, it has been said, the "well-educated man" meant one who had received special literary instruction. By Rousseau's theory it meant a well-developed man, fully prepared for the conditions and accidents of human life. "In the natural order of things," says the author of *Émile*, "the universal vocation is the human state: whoso is well educated for that cannot fill badly any of those conditions that it includes. Before the vocation chosen for the child by his parents, Nature has called him to human life. To live is the trade I would teach my pupil. Upon leaving my hands, he will not be a soldier, a lawyer, nor a priest: but, if I am successful, he will deserve first of all to be called a man; and hence all that a man can and should be or do — he will, at need, be able to fit himself for, as well as any other. And though Fate may change his position, whatever profession she may call him to, he will know how to make it his own." Accepting education, however, in this sense as the development of natural faculties, and the entrance into the full possession of human life, we have to recognize that the share taken in this education by parents and teachers is comparatively limited and, if a helpful, a subordinate share. Each one of us, in Rousseau's words, undergoes three educations; and this necessarily, whether these educations tend to form or to disfigure us. First of all, there is the education of nature, through the development of our bodily, mental, and moral faculties. Secondly, there is the education of things — the lessons of experience and the influences of external surroundings. And thirdly, there is the education we receive from our fellow men and women, either deliberately bestowed upon us as instructions and counsels, or unconsciously imposed upon us by force of examples.

Education according to Nature. — Now of these three educations, the first lies absolutely beyond the human educator's control; and the second is only to a small extent and under favorable circumstances subject to his direction. And since it is evident that a mind divided against itself is not well trained, it follows that a wise educator will make his method agree with those methods he cannot alter; in other words, he will be careful that his system of education harmonizes with the education of nature and the lessons of experience.

Here, then, we have Rousseau's first rule. A wise education follows and corresponds with the natural development of physical and mental faculties, and seeks to perfect these faculties by exercising them And as these faculties are not all developed at once but follow a gradual process of growth, a sound method of education follows and regulates itself by this natural method; suiting its exercises at every age to the faculties that are alert and active at that age, and refraining from any effort to call into play prematurely those that are not yet healthily developed.

The educator, then, has to make his first study the order of nature in developing human faculties; and special attention is necessarily demanded in the case of those stages of human life which the individual passes through without remembering them, and which consequently remain as dark to the average man as though they belonged to the experiences of a different race.

Half the errors Rousseau found in the existing methods of education, he traced back to this failure on the teacher's part to recognize that childhood has its place in the order of human life; that consequently, like every other state, it is ruled by its own laws, derived from its own needs and interests, and not by the laws derived from the needs and interests of any future state.

"We do not understand childhood," he says. "With our false views of this condition, the further we go, the more we wander from the right path. The wisest amongst us are too apt to make the first consideration what is most desirable the future man should know; whereas the first consideration should be, what it is possible and for its own interest that the present child should learn. Our teachers will always be seeking the future man in the child, instead of attempting to understand the child as he is and before he becomes a man. . . . But this is the question I have set myself to study. I may not have seen correctly what I seek, but I believe I have at least grasped rightly what is the object of the search. . . . Humanity has its place in the order of beings, and childhood its place in the order of human life. If we attempt to change this order, we shall only produce precocious fruits, that will wither and decay before the time. We shall have learned prodigies, and childish men. Childhood has its own way of seeing, thinking, and feeling, suitable to its condition; nothing can be less reasonable than to attempt to substitute for these our own ways."

In modern ears this proposition gains acceptance, simply because Rousseau's point of view has been adopted by all enlightened educationalists. But from the point of view of Rousseau's predecessors, who, "seeking always the man in the child," found in it always an immature and foolish sort of creature, nothing could be more reasonable, and indeed necessary, than for the teacher to substitute his own ways of seeing, thinking, and feeling for the child's ways; inasmuch as it was taken for granted the child's ways were wrong or at any rate stupid ways.

We must recollect that the child was held in very poor esteem, when it was not held in very bad esteem, by former educators. But it was not Christian theologians alone who discovered gluttony and envious rage in a babe at the breast, and supposed the evil inclinations of childhood held in check only by terror of the rod. We have the freethinker Hobbes describing the wicked man, the criminal, as a "robust child," which of course amounts to calling the child a "weak criminal," with bad inclinations restrained by want of power. Even the kind-hearted Locke has nothing better to say for the childish mind than that it is "a blank sheet of paper, whereon the educator may inscribe what characters he pleases."

It will be seen how complete a change in the purposes and method of education was the result of Rousseau's position with regard to the child and the state of childhood. The first was no longer the unregenerate or the immature man, from the moment that the second was accepted as a state of human existence having its place, like early manhood, maturity, and age, in the order of life. This once established, the rights and obligations of this state were, by Rousseau's theory, to be determined by its own interests not by the requirements of any state outside of itself. In other words, the purpose of childhood is its own perfection — and this purpose is accomplished when the child obeys the laws of its constitution and exercises the faculties that belong to its condition.

The object of the wise educator is then not to form the child to suit any system but to form a system that will suit the child. And since, by the method of nature, the faculties first developed are those physical ones necessary to the alertness of the senses and to bodily vigor, it follows that the first education must be purely physical and in other respects continue a negative one until reason and the moral sense are awake.

Negative Education. — And here we come to the clause in Rousseau's doctrine that has been constantly misunderstood by critics who will not take the pains to discover that in this theory of life all ideas hold together, and must be accepted or rejected accordingly as we recognize or repudiate the theory. "The most important, and useful advice," declared the author of *Emile*, "to be given a teacher occupied with the education of children under twelve years of age, is not to gain time, but to lose time; to postpone as long as possible the treatment of subjects that require, to understand them, the exercise of reasoning and moralizing powers." The grounds for this delay are not at all that physical development is considered of more moment than moral or intellectual training, but that, in the order of nature, Rousseau finds physical faculties are those first developed; and hence that he considers it worse than futile, mischievous, to endeavor to forestall nature, and to impose upon the child ideas and sentiments that it cannot accept in a true sense, because it has not become capable of arriving at the true knowledge of them through the exercise of its own faculties. "The most dangerous interval in human life," he says, "is from birth to the twelfth year. This is the period when, if the seeds of error or vice are sown, we are absolutely without instruments wherewith to attack them; and it may be, before the instruments are developed, the errors have struck so deep a root that one cannot reach them. If children leapt suddenly from infancy to the age of reason, the education now given them might be a suitable one. But, since the order of their natural progress is what it is, an exactly opposite course should be followed. No appeal to reason or the moral sense should be made until these faculties are healthily awake. Distrust all sentiments anterior to the power of right feeling; and hold back impressions and opinions that cannot be clear and true until power of judgment is there to show them to be right and reasonable. The first education must be purely negative; and it is plain why it should be so. Before commencing to exercise any art, one must provide one's self with the necessary instruments, and have a care that these instruments are fit for use and strong enough for wear and tear. And, thus, before beginning to think, one must exercise the senses and all bodily faculties that are the instruments of the mind. And to get the best possible use from these instruments, they must be strong and well formed; in other words, the body that supplies them must be healthy and robust."

Positive Education. — To make the senses, by suitable exercises, serviceable instruments of the mind; to cultivate physical faculties in such a way as to form just powers of observation and correct impressions of external objects; to encourage the child to take the measure of its own strength and to form an accurate estimate of its own relations to outside persons and things; and also to train it by experience to recognize what Rousseau calls beautifully, "the stern yoke of necessity beneath which all finite things must bow—" here should be the limit of all positive training during the first period of education. But with the positive training should go also the negative education; which does not consist simply in doing nothing, but in using care to prevent any harm being done in the way of establishing convictions or awakening premature emotions which, whilst the child has not the power to grasp them truly, can come only as wrong impressions and false sentiments that will develop into irrational superstitions and incurable prejudices. "I call a positive education," Rousseau writes, "one that tends to form the mind prematurely and to instruct the child in the duties that belong to a man. I call a negative education one that tends to perfect the organs that are the instruments of knowledge directly, and that endeavors to prepare the way for reason by proper exercise of the senses. A negative education does not mean a time of idleness; far from it. It does not give virtue — it protects from vice; it does not inculcate truth — it protects from error. It disposes the child to take the path that will lead him to truth when he has reached the age to understand it, and to goodness when he has acquired the faculty of recognizing and loving it." That a negative education does not mean a time of idleness for either the teacher or the pupil, every one will discover who is at the pains of studying the second book of the *Émile.*

Sense Training. — "To exercise the senses," Rousseau says, "does not mean simply the use of them, but to use them in the way that forms powers of judgment and teaches right feelings; for we do not properly know how to feel, how to touch, to see, or to hear, until we have learnt." This training of the senses to be efficient and trustworthy instruments of the intellect, and, further, this obligation on the part of the educator to set his mind to the same key as his pupil's mind, in order that premature and consequently erroneous judgments may not be formed, actually demand more intelligence and devotion in the teacher than any positive method of instruction requires.

The first education ends with the first stage of life and the requirements it was formed to meet. The boy or girl, having attained the age of reason, needs other lessons; but always directed by the same plan and with the same end in view — the development of power through self-activity, and the perfecting of the instruments of knowledge.

Adolescence. — From the twelfth to the sixteenth year we have the period that Nature herself — so Rousseau declares — seems to indicate as the one most suitable for what is generally called education. During these few years, for the first and only time in life, the powers of the mind and body are in excess of the requirement of the hour. Actually, the boy has less strength than the man; but relatively and in proportion to the demands made upon him, he has more. This is "the tranquil age of intelligence, when the sleep of reason is over and before the passions are awake."

But this precious interval of leisure is too brief to press into it all the instruction required. The method followed, then, must still be the same: to strengthen the instrument of knowledge and to kindle the taste for it; to set the pupil on the right road to obtain it for himself and to provide him with rules for his own use and guidance upon the way. From this method follow certain directions that are also entirely different from the rules of the older method, when the purpose was to develop not independent power but the docile submission of the young mind to instruction given upon authority.

"As few books," Rousseau urges, "as possible. The child who reads often merely learns words. Endeavor to draw forth powers of observation, direct the attention to natural phenomena, awaken curiosity but do not satisfy it. Put your pupil on the right road to find for himself the answers to his own questions. . . . In commencing the study of the natural sciences, for instance, I would on no account introduce my pupil to a well-furnished laboratory. All this paraphernalia of instruments, all this complicated machinery, offends me. Either the child is bewildered by it and alarmed, or curiosity about the instruments draws away his attention from what they serve to demonstrate. As far as possible I should wish to make our own instruments; and, having made up our minds as to the experience we require, we should set ourselves to find out for ourselves the means of obtaining it. Better that our instruments should be less perfect, if the knowledge we get by them be more complete. It is undeniable that we have clearer notions of those things we teach ourselves than of those we learn by the instruction of others. What is more, we do not accustom the reason to a servile submission to authority; but we make ourselves more ingenious, independent, and self-reliant if we resist the indolent habit of yielding our minds up to be served by others, in the same way that certain men give over their bodies to be dressed by their valets, waited upon by their lackeys, and dragged about by their horses, until their limbs become stiff and feeble through want of use. Among so many admirable methods for making the course of study easy, I would have some that made it difficult, in order to compel the mind to use healthy efforts to conquer difficulties." F. M.

See Nature; Humanism and Naturalism; Froebel; Pestalozzi; Philanthropinum.

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ROUTINE IN SCHOOLROOM. — See School Management.

ROWING. — One of the oldest and most popular sports engaged in by students. Races have been held between crews representing Cambridge and Oxford universities since 1829; they became annual races in 1856. Eton and Westminster also began to have races at the same time (1829). A large proportion of the students in the universities and public schools of Great Britain participate regularly in this sport. The Oxford and Cambridge race is held on the Thames between Putney and Mortlake, a course of four and a quarter miles. Rowing is the oldest organized sport in American colleges. The first intercollegiate athletic contest held in America was a boat race, rowed on Lake Winnepesaukee, N.H., in 1852, by crews representing Harvard and Yale. Except for interruptions in 1856, 1857, 1858, and during the Civil War, annual races have been held regularly since 1852, and many other colleges have taken up the sport. Rowing has maintained a high place in American college athletics against the competition of baseball, track athletics, football, and the many other games which have been introduced during the last fifty years. A few preparatory schools patterned after the English public schools early adopted rowing, but competition was limited to races between crews from the various "houses" within the schools. Since 1890, a considerable number of public high schools and some private schools in Boston, Springfield, New York, Philadelphia, and other cities have taken up rowing, but up to the present, comparatively few inter-school races and regattas have been held.

The history of rowing in American colleges and schools throws light on some of the vital problems in college athletics. Although a major sport and the oldest, rowing has been absolutely free from the evils of professionalism, commercialism, and unsportsmanlike tactics which have threatened the continuance of nearly all the other college sports. It is probable that the absence of gate receipts, the limited number of contests, and the character of the sport (no personal contact between competitors) are mainly responsible for the fact that rowing has remained on a high plane of amateurism. But rowing has not escaped criticism. Educators, physicians, and laymen have made repeated charges that oarsmen are short-lived and that consumption and heart disease are frequently the cause of the premature deaths. Two investigations of this subject were made; one by Dr. William Morgan (*University Oars*, London, 1873) and the other by the writer (Effects of Rowing on Harvard Oarsmen, *Harvard Graduate Magazine*, March and June, 1903). The two studies showed that oarsmen live longer than men accepted by life insurance companies, and also that they rarely suffer from consumption and heart disease.

Many of the college races are over a distance of one and a half to two miles, but the most important annual contests are over a four-mile course. There is some difference of opinion concerning the danger of four-mile races. Some hold that no races should be longer than three miles, while others believe that the four-mile race is perfectly safe for carefully selected and well-trained men. Until some evidence is found showing that college men are injured by rowing in four-mile races, it is probable that the sport will continue to prosper as at present conducted.

Rowing, properly taught and supervised, is a splendid exercise to develop good posture, strength, and endurance. The period of training usually extends over three months on the rowing machines in the gymnasium and about the same length of time on the water. From the standpoint of physical and moral education, rowing is undoubtedly the most valuable of college sports. The long period of training with systematic exercise, simple food, and regular hours of sleep inculcates habits of hygienic living; the rigid discipline, the absolute obedience to the coach and captain, the spirit of sympathetic coöperation and mutual helpfulness essential for success, and the devoted friendship existing between fellow oarsmen are most valuable agents in the molding of character. G. L. M.

See ATHLETICS, EDUCATIONAL.

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ROXBURY. — See COLONIAL PERIOD IN AMERICAN EDUCATION.

ROYAL COMMISSIONS. — See COMMISSIONS; PARLIAMENTARY COMMISSIONS; ENGLAND, EDUCATION IN.

ROYAL HOLLOWAY COLLEGE. — See LONDON, UNIVERSITY OF; WOMEN, EDUCATION OF.

ROYAL INSTITUTION OF GREAT BRITAIN, LONDON. — An association formed in 1799 at the suggestion of Sir Benjamin Thompson, Count Rumford, as an offshoot of the Society for Bettering the Condition and Increasing the Comforts of the Poor (1796). A number of fellows of the Royal Society, including Sir Joseph Banks, became interested in the proposal. The society was chartered in 1800 as the Royal Institution of Great Britain for the Promotion, Diffusion, and Extension of Science and Useful Knowledge, and was located in a house in Albemarle Street. According to Count Rumford's ideas, the Institution was to be a mechanics' institute and school of domestic science as well as a museum for exhibiting inventions discovered for man's welfare and public service. The Institution attracted much support in its early years, but, when Count Rumford relinquished it in 1801, this gradually fell off. The plans were changed, and the Institution began to devote itself to providing scientific lectures. It was saved in 1801 by Humphrey Davy, whose lectures for ten years attracted fashionable London society to the Institution. Another brilliant lecturer who helped to establish the security of the Institution was Michael Faraday (*q.v.*). In 1833 Mr. John Fuller established two research professorships in chemistry and physiology, and other grants have been made. In 1896 the Davy-Faraday Laboratory was given to the Institution. Among other scientists who have worked and lectured there are Young, Brande, Frankland, Tyndall, Rayleigh, Lankester, and Dewar. The Institution is the only one of its kind in Great Britain which has professors whose main work is research rather than teaching. Short courses of lectures are given during the year, and discourses on scientific and general literary subjects are held on one evening in each week from January to June. The Institution exercised great influence during the last century in promoting general interest in the study of science, and in 1854 a number of lectures were delivered on the place of different sciences in education (*Lectures on Education*, London, 1855).

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ROYAL SOCIETY, ENGLAND. — See SCIENTIFIC SOCIETIES.

ROYAL UNIVERSITY OF IRELAND. — See IRELAND, EDUCATION IN.

RUDOLFF, CHRISTOFF. — One of the most successful writers on algebra and commercial arithmetic in Germany in the sixteenth century. He was born in Jauer about 1500, but the dates of his birth and death are unknown. He wrote three books: (1) an algebra, known as the Coss (see ALGEBRA), which appeared in 1525, and of which Stifel (*q.v.*) prepared a second edition in 1553; (2) the *Künstliche Rechnung* (1526), which went through several editions; and (3) a collection of problems (1530). D. E. S.

RUGBY SCHOOL. — Rugby is the fourth in antiquity of the seven Great Public Schools of England and ranks in the same position among them now. This school was founded under a deed, a will, and a codicil of Lawrence Sherriffe, citizen and grocer of London, dated in 1567 and was opened in or about 1574. Unlike the other public or grammar schools of England, great and small, it was a purely private foundation and never obtained a royal charter or other public recognition until a private Act of Parliament passed in 1777. Rugby was only a small village, there not being more than 100 houses in the whole parish. The school was no great foundation like the more than princely creations of the great pre-Reformation churchmen William of Wykeham, William Waynefiete, or Thomas Wolsey, though it was due to the same motive of making a return in charity to his native place by one who like them had "thriven to thane-right" from small beginnings. Sherriffe's rise was in a humbler sphere than that of Chancellor or Bishop, he being a grocer, or dealer in spices, though as the spices were supplied to no less a person than Queen Elizabeth when Princess, and she granted him, soon after her accession, a coat of arms in which the Tudor griffin and the royal rose and fleur-de-lis as well as a bunch of dates appeared, his spices must have been highly valued. Like other successful persons who became founders, from Wykeham downwards, he dabbled in the purchase of dissolved monasteries, and the main endowment given to the school, the rectory of Brownsover, had belonged to Leicester Abbey. The foundation document was a deed poll dated 22 July, 1567, headed "The Intente of Laurence Sherriffe" by which Sherriffe with George Harrison, gentleman, and Bernard Fields, another grocer, declared "the confidence, trust and intent" for which he had bargained and sold the parsonage of Brownsover in the parish of Rugby, viz. to build near his mansion house in Rugby "a faire and convenyent school-house" and four lodgings for four poor men and "cause an honest, discreet and learned man being a master of artes to bee reteyned to teach a Free Grammar Schoole" therein to serve chiefly "for the children of Rugby and Brownsover and next for such as bee of other places thereunto adjoyneing." It was, in fact, to be a purely local grammar school, free from tuition fees, for the benefit of Sherriffe's poorer neighbors. The combination of school and almshouse was common (see HOSPITAL SCHOOLS), and even Eton (*q.v.*) was a specimen of it. But Sherriffe's was more like the small foundation in the village of Ewelme, Oxfordshire, of the Duke of Suffolk in 1437. Like the Ewelme almsfolk, Sherriffe's almsmen were to receive 7*d.* a week, or a penny a day each. The smallness of the school contemplated appears from the fact that the "Scholemaister of Laurence Sherriffe of London, Grocer" was to have only "for his sallary or wages the some of £12," whereas the pay of the master of the Merchant Taylors' School founded three years before was £185 a year. Even at Harrow (*q.v.*), at which no form higher than the fifth was contemplated, the pay was £26. 13*s.* 4*d.* Moreover, at Merchant Taylors' three assistant masters, a chief and two under ushers, and at Harrow an usher, were provided for, whereas there was no provision for any usher at Rugby. By Sherriffe's will personally made the same day as "The Intente," besides gifts of £5 to Rugby church and another £5 for the market cross and the bridges there, he gave £50 "towards the building of a schole howse and alms howse in Rugbye." Even then £50 would not go far towards a school and almshouse. The school at Harrow cost more than £400, though it was only fifty-six feet by twenty feet, with two chambers for the master and usher. It would appear therefore that Sherriffe did not contemplate a school of more than fifty boys at the outside. The deed and will were made evidently in haste, owing to illness at London. A month later, 31 August, Sherriffe was at Rugby and there made a codicil without which the school would never have come to great days. It revoked a gift of £100 given in the will to buy more lands for the school, and gave instead one third part of all the founder's lands in Middlesex after his wife's death. These "lands" appear to have been no more than a single field called the Conduit Close, consisting of twenty-four acres let at £6 a year. It had probably been part of the possessions of the monastery of Charterhouse, like the thirteen and one fourth acres of land close to the "Lyttle Condyte" street given three years before by another successful citizen, William Harper, a merchant tailor, for the endowment of Bedford Grammar School. The fortunes of both schools have been made by the land growing in value with the growth of London, Rugby definitely becoming "a great public school" when the land became building land. The school, built on the "post and pan" style of Warwickshire buildings of the day, appears to have been opened about 1574 under Edward Rolston, who duly qualified by taking his M.A. degree at Christ's College, Cambridge, in 1572. But on so meager a scale was the Intente carried out that the almspeople were actually housed in the "mansion-house" with the master. At first the school spent a great deal of its time and money in Chancery, owing to suits with the founder's brother-in-law and nephew who had been given a lease of the land at a fixed rent. The first known Rugbeian to go to the university was entered at Sidney Sussex, Cambridge, in 1621. An admission register began to be kept in 1675, and shows what was probably the whole school of twenty-six boys, of whom more than half were village boys, but twelve were apparently boarders. In 1684 and 1685 there were no entries. Under Henry Holyoake, however, a chaplain of Magdalen College, Oxford (one of those ejected by King James II in his attempt to Romanize the college), who, thanks to the rising rent of the Conduit Close, enjoyed a salary of £56 a year and reigned for forty-three years from 1688, the numbers rose to about 100. The trustees and other country gentlemen of the county began to send their sons. A Speech Day was inaugurated. His successors let the school down again. But in 1748 an act of Parliament was obtained to authorize raising a mortgage on Conduit Close, with the proceeds of which a new master's house outside the then town, and eight acres of land adjoining, were purchased and a new school built. The original school was vandalistically pulled down. In 1777 a further act of Parliament was obtained for building leases of the Conduit Close and raising the salaries and number of the masters. The first master under the act was Thomas James, an Etonian. It is due to him and to his second master, George Innes, a Wykehamist, that the rise of Rugby from a local to a "great public school" took place. There is no distinction, properly speaking, between a grammar school (*q.v.*) and a public school (*q.v.*). In 1621 the Sidney Sussex Register calls Rugby a public school (*communis schola*). But there is a distinction in fact between the grammar school which is a great national school drawing its pupils from all over the kingdom, and now from the colonies as well, and the grammar school which is chiefly peopled, as Rugby was intended to be, from its immediate neighborhood. James, by introducing the Eton system of separate dames' houses for comparatively small numbers of boarders instead of all being placed in one large headmaster's house, gave the great lift to the school. He found fifty-two boys in June, 1778, he left 245 in June, 1794, and six assistant masters, instead of the one usher. The prepositor or prefect system of Eton and Winchester if not introduced by him was at all events in full swing under him. His reign did not pass without trouble, but under his successor there was a full-blown rebellion of the French Revolution type in 1792 which was only put down by the assistance of a company of soldiers. John Wooll, a Wykehamist, who followed in 1806, raised the school to a far greater height both of numbers up to 381 and of reputation. His chief material achievements at Rugby were the rebuilding of school buildings in 1809 and 1815, the making of the school close by throwing the three fields into one and the consequent development of Rugby football with its curious feature of running with the ball instead of kicking it, and the building of the first school chapel in 1819. Wooll's name is perhaps best remembered now in connection with the remark said to have been made in 1822 when he flogged a whole form of thirty-eight boys for going on strike in the middle of a lesson, that there was "Great cry and little Wooll."

Another Wykehamist succeeded in 1825, Thomas Arnold (*q.v.*), perhaps the best-known name in the educational world. Most unfairly for his predecessors, James and Wooll, he has in common repute been hailed as the maker of Rugby, the creator of the self-governing pupil system, the introducer of the system of trust in the boy and of character building into the English public school system generally. No one would have more emphatically repudiated any such misrepresentation than Arnold himself. Rugby had, as we have seen, been created a great school and enjoyed the full prefect system for seventy years before. As regards numbers, Arnold diminished and did not increase them. Bound by his Winchester antecedents he seemed to have regarded 250 as the ideal number of a school and to have reduced Rugby towards that number by wholesale weeding out of undesirables. The principle of trusting the boys and trusting them, in fact, not as slaves or subjects but as citizens was directly imitated from his own master Goddard (*q.v.*) at Winchester. As for there being anything new in the encouragement of religion or the inculcation of a high moral standard or the formation of character, it was the commonplace of every grammar school with an able master from the days of Quintilian The great merits of Arnold were his breadth of mind and his enthusiasm, qualities not too frequently conjoined. The energy and the virility of his lessons and his sermons were an inspiration. He always urged the humane, the liberal, the advanced view of every subject, and made the dry bones of the classics and of history live. His greatness as an educator may be gauged by his having made types so different as the retiring literary churchman, Dean Stanley, and the robust lawyer, Tom Hughes, both regard him as the greatest man of the age, and in the sober biography of the former and the novel of the latter, *Tom Brown's Schooldays*, enshrine him for all time as the Hero as Headmaster. Except for one short interval, which ended in a suit in Chancery to reinstate a dismissed headmaster, Rugby School has well maintained the statutes and improved on the numbers as

Arnold left it. With 570 boys, of whom 540 are boarders in nine houses at fees of £123 a year, — which contrasts strangely with the £16 a year and extras paid in 1794, — under the Rev. A. A. David, appointed in 1910, who had already achieved success as Headmaster of Clifton College, the school is second to none in strenuousness and scholarship. A. F. L.

See Arnold, Thomas, and the references there given.

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RULE OF THREE. — See Ratio and Proportion.

RULES, SCHOOL. — See School Management.

RUNKLE, JOHN DANIEL (1822–1902). — Leader in the movement for the introduction of manual training (*q.v.*) in the elementary and secondary schools of the United States; was educated in academies in New York state, and was graduated from the Lawrence Scientific School of Harvard University in 1851. He was professor in the Massachusetts Institute of Technology from 1865 to 1870 and president from 1870 to 1878. The manual training exhibit from the city of Moscow, Russia, at the Centennial Exposition at Philadelphia in 1876 interested him keenly; and he became the leader of the movement that resulted in the introduction of manual training in American schools. He established the first summer school of mining (1871), and it was largely through his efforts that the Lowell School of Practical Design was established. He was editor of the *Mathematical Monthly* from 1858 to 1861. His educational publications include *Manual Element in Education*, *Report on Industrial Education*, and *Analytic Geometry*. W. S. M.

See Manual Training.

RUNNING. — Unquestionably the oldest and most widespread athletic exercise. It occupied a prominent place in Greek physical education and has played a prominent part in all medieval and modern schemes for bodily training. The running race was the chief event of the Olympic Games (*q.v.*); the highest honors and rewards were bestowed upon the victor, and his name was given to the next Olympiad. Running was one of the first sports taken up by the students of British universities and public schools when athletics were introduced during the first half of the nineteenth century. The introduction of running races in American colleges dates back to the early seventies, when American students began to imitate the athletic sports of their English brothers.

The standard running races are divided into three groups: the *sprints*, including the hundred yards and two hundred and twenty yards flat races, and the hundred and twenty yards high and the two hundred and twenty yards low hurdles; the *middle distance* runs which include the quarter mile and half mile races; and the *long distance* runs, including the one, two, five, and ten mile runs and the marathon, which is a little more than twenty-six miles.

Running is a popular and widespread exercise because it requires no elaborate or costly equipment, and it may be practiced by students of both sexes and all ages, from the elementary school to the university. The middle and long distance runs are not suitable for boys under seventeen or eighteen years, and they should never be indulged in by girls. Races of more than five or six miles are so exhausting that only a few young men possessed of exceptional physical endowments can participate in them without serious danger of permanent injury. When practiced judiciously, running contributes to the normal development of the heart and lungs; it improves posture and increases health and vigor. The risk of injury to heart and lungs is very great when running is carried to excess or when students with organic defects are allowed to participate in races. Careful medical examination of all students is essential to avoid the risk of injury to those who are not organically sound.

Prior to the year 1900 organized running races were confined to colleges and secondary schools, but since that time athletic leagues have been organized in the public elementary schools in many American cities with the result that tens of thousands of boys ten to fifteen years old practice running and engage in races from 50 to 220 yards. The results thus far have been most satisfactory. With adequate supervision by the school authorities to insure proper ethical standards and the prevention of excesses, this movement promises to contribute very materially to the physical and moral development of the future citizens. G. L. M.

See Athletics, Educational.

RURAL HIGH SCHOOLS. — See High Schools, section on Rural High Schools.

RURAL SCHOOLS. — **Character of Rural Schools.** — A term applied to schools located in the rural or country districts, as distinct from city, town, or village schools. (For historical treatment see District System.) In general, rural schools as found in the United States are elementary in grade, have but one teacher to the school, and minister to the educational needs of a limited and often a rather sparsely populated area known as a school district. Sometimes, however, we find rural schools with two or more teachers, and sometimes, also, high school as well as elementary school grades. Such schools, though rural in location, are usually termed central, union, graded, or consolidated schools (*qq.v.*), and are not, strictly speaking, rural schools in anything but location. The typical case is the one-room rural school attended by from seven or eight to thirty or forty pupils, though fifteen to twenty pupils is a more common number. Such a school is located somewhere near the center of a certain described area from three or four to fifteen or more square miles in extent. This is commonly known as the district school, from the form of educational organization, the school usually being cared for by a locally elected representative body, usually three in number, and known as district school trustees or district school directors. The school district is the rural school unit, and a town or city is in a sense only a rural school district grown large.

Except in states using the town system (*q.v.*) of school organization (New England) and a few other states using the township as the school unit (see TOWNSHIP SYSTEM) where centralized schools are common, each county is subdivided into a varying number of such school districts. These districts are not fixed forms, but are constantly being changed and the number increased or diminished to meet the needs of new school populations or new educational conditions. This is done by some central county authority, such as the County Board of Supervisors, acting, on petition, and on the advice of the County Superintendent of Schools. An old district may be divided into two districts, a new schoolhouse is built, and a new board of district school trustees is elected to take charge of the new school. District boundary lines, too, are changed from time to time to meet new needs or, better, to suit the convenience of children in attending school. Some districts increase in population sufficiently to develop into villages or towns, and a more complex graded school system supersedes the earlier district school. A very common condition is a county containing a city school system, three or four town school systems, and then from 75 to 100 rural schools, scattered all over the county. Very few of the rural schools employ more than one teacher, and each provides elementary instruction to a small number of pupils. The work is usually graded, in a way, but commonly the instruction is in part individual and often limited entirely to the old staple school subjects. Each school is under the control of a board of three school trustees, who employ the teacher, sometimes designate the course of instruction and adopt textbooks, care for the property, and in general manage and supervise the school. (See DISTRICT BOARDS OF TRUSTEES; DISTRICT SYSTEM; DISTRICT MEETING.)

Rural schools are to be found in all of the American states, and in all other countries which have established state school systems. Naturally a much larger percentage of the schools are rural in some states and sections of the country than in others. In the southern and western states more rural schools are found than in the states to the north and east. In general, the percentage of rural schools in a state is proportional to the percentage of the total population living in country districts. In the agricultural states, such as Georgia, Texas, or Nebraska there is, relatively, a much larger number of small one-room rural schools than is the case in such manufacturing states as Ohio, New Jersey, or Connecticut.

In some of the states, too, the rural schools are much better organized, equipped, and more advanced than is the case in others. In part, this varies with the wealth and commercial advancement of the states, and in part it is a product of wise legislation with reference to taxation and support. One reason why the rural schools of California rank so high is that wise legislation has for long provided adequate funds with which to maintain each rural school. (See CALIFORNIA, STATE OF.) Even at their best, though, the rural school seldom equals a good town or city school in efficiency, and this condition has given rise to what has been termed The Rural School Problem. (See also special articles on DISTRICT BOARDS OF TRUSTEES; DISTRICT SYSTEM; and DISTRICT MEETING.)

The Rural School Problem. — Originally, nearly all of our schools were rural schools, and all were very much alike. With the growth of towns and cities, and with the development therein of new forms of educational effort to meet new and rapidly changing educational conditions, an increasing difference between rural schools on the one hand and town and city schools on the other has taken place. During the past fifty years very marked social and industrial changes have taken place in American life, and in the conditions surrounding the educational process. The cities, as a class, have made a strong effort to develop schools capable of meeting these changed conditions. Even the smaller towns have, in part, reshaped their educational systems with a similar end in view. New interest has been awakened, new types of schools have been established, new subjects of instruction have been introduced, and questioning and criticism have taken the place of an earlier contentment with educational conditions. (For a more detailed statement of these changes and of the new needs that have arisen, see under CONSOLIDATION OF SCHOOLS.)

The rural school, on the contrary, has responded but little to these changed conditions, and has been largely omitted in the process of reconstruction and criticism which has taken place. During the past two decades, however, attention has been forcibly directed to this phase of our educational problem, and probably no part of the country's educational system has received more attention during recent years. Much thought has been given to the problem, much has been written on the subject, and a number of reports have been made. On closer examination, it has been seen that the problem is not a single or an isolated one, but is in reality only a part of a still larger problem, affecting almost all of the conditions surrounding rural and village life. The old social and industrial conditions, which gave rise to the little village or the rural settlement, with its little church, its little school, its general store, and its limited life, have in large part passed away. The changes affecting rural life, during the past half century, have been numerous and far-reaching, and the effect of these changes is seen to-day in the disappearance of the rural and village churches, the decline of the rural school, and the elimination of the rural store, while the whole nature of rural and village life has changed. Even the rural school problem itself is not a single or a simple one, but is in turn composed of a number of related questions, the chief of which are those (1) relating to teachers, (2) instruction, (3) maintenance, (4) organization and control, (5) supervision.

Attempts to Solve the Problem. — The first of the attempts to solve the problem was along the line of the training of the teachers. For a time this was thought to be the key to the whole problem. Normal schools were multiplied, institutes were improved, reading circles were formed, and summer sessions of normal schools and colleges were begun. (See TEACHERS, TRAINING OF; TEACHERS, IMPROVEMENT OF, IN SERVICE.) These agencies have rendered valuable service to the more progressive of the teaching force. Still more recently a number of states have organized teachers' training classes in the high schools of the state, in an attempt to provide for the rural schools a teaching force possessing some professional training. This has been even more valuable. (See HIGH SCHOOLS, NORMAL TRAINING CLASSES IN.) A few states have gone even farther, and have ordered that all teachers, after certain designated dates, shall have had some professional training. While all of these improvements have been very valuable, and the net result has been an improvement in the mental capacity and teaching skill of our village and rural teachers, they have not solved the rural school problem. The improvement of the teachers alone can never solve the rural school problem, for the reason that it does not touch the problem deep enough down.

The next attempt to solve the problem was along the line of trying to modify and enrich the instruction, and to adapt it better to the needs of country life. This idea has been a fruitful one, and some noteworthy progress has been made in this direction. The introduction of instruction in the elements of agriculture, which has been a marked feature in the improvement of rural education, has been, during the past half-dozen years, of great benefit to the schools. (See under AGRICULTURAL EDUCATION.) The results of such instruction have been to awaken a new interest in the rural school, and this has, in turn, opened the way for other needed improvements. Economic conditions have helped greatly in the introduction of agricultural instruction, but this alone is only a small part of the needed change. Notwithstanding many advances here and there, it may still be said that the movement for the reorganization of the elementary school course and the introduction, in addition, of instruction in manual training and household arts, has as yet hardly been begun. Other attempts to solve the rural school problems have been made in the direction of an improvement of the school trustee. Annual meetings of all trustees in a county, or of representatives of each board of trustees, have been provided for recently by a number of states. Those attending are paid their expenses, and usually a small *per diem*, and at the meetings questions of finance and school management are considered, and the duties, powers, and functions of trustees are explained to them. The plan, while possessing merit, will do but little toward reaching or remedying fundamental conditions, for trustees change faster than they can be educated by such a plan.

While all of these expedients have been good in themselves, they have not reached the root of the matter, and the general result has been that progress in the improvement of the rural school has not been made as fast as conditions have changed. Our rural schools, while undoubtedly better than they were a generation ago, are probably still farther behind the level of good city schools than they were when the agitation for their improvement began. In any case, they are much poorer and much less effective than they ought to be. This is unnecessary, for under proper conditions as good schools can be provided in the country as in the cities and towns.

Almost all attempts to improve rural schools are limited by certain fundamental defects in present rural school organization and management, and until these can be removed no very fundamental improvement of rural school conditions is possible. Remedial measures may be applied, but fundamental changes will not be made. These fundamental defects class themselves under the headings of (1) lack of money, (2) defective organization and control, and (3) lack of adequate supervision. It is because so few of the attempted reforms have touched these underlying factors that so little fundamental progress has been made.

Maintenance of Rural Schools. — An absolute prerequisite to any fundamental improvement in rural education is the provision of adequate financial support. Merely to pass laws permitting school districts to tax themselves at a higher rate will not solve this problem. In many rural communities the rate of tax for schools is already too high, and much more than is paid by cities and towns for vastly superior educational advantages. Still further, the need for additional taxation to provide better educational advantages is not only not apparent to most rural communities, but the tendencies of such to thrift, economy, and close bargaining are not conducive to increased liberality in matters of public taxation. The remedy must lie in the abandonment, in large part, of the idea that schools must be supported wholly or chiefly by strictly local taxation (see TAXATION FOR EDUCATION), and, in addition, in the substitution of better methods of apportioning both state and county school funds. (See APPORTIONMENT OF SCHOOL FUNDS.) Sixty years ago the question of public education at public expense was fought out in this country, and it was decided that the wealth of the state should educate the children of the state. Since then conditions have changed so completely that to-day there is the greatest need in most of our states for a reconsideration of the whole question, with a view to providing plans of taxation and apportionment which shall better equalize both the burdens and the advantages of education. Adequate finance lies at the basis of any marked improvement of our rural schools. There must be a doubling of available funds if anything like satisfactory results are to be obtained. Part of this increase must be obtained by increased taxation, part by changes in the methods of apportioning funds, and part by a reorganization and reconstruction of rural education itself.

Control of Rural Schools. — This reorganization and reconstruction of rural education is needed chiefly along the lines of management and control. The district school system, which once doubtless rendered a valuable service, is to-day outgrown and should be abandoned as soon as possible for a system of school organization and control better adapted to modern needs and problems. The district system of school organization and control has been condemned generally by school officials for forty years, and the chief reason for its extensive retention is that the people in many states have never known any other system, and are wholly unaware how much better schools they might have under a better system of school organization and control. (For a detailed statement of the evolution and present shortcomings of the district system, see DISTRICT SYSTEM; DISTRICT MEETING; DISTRICT BOARDS OF TRUSTEES.) There is no educational or business reason for the large number of school officials and the small units of organization made necessary under the district system. The system is expensive, inefficient, and unprogressive; the schools created under it are but little related to one another or to the educational needs of a country; and progress under the system is painfully slow. Instead of providing good educational advantages for all, and then leading in unbroken sequence to a high school education for all, the district system usually does nothing of the kind. By an educational reorganization of the school system of any county where the district system prevails, it would be possible to provide a good and closely integrated school system, at no materially greater cost, and with the use of fewer but better teachers than are at present employed.

Efforts have been made to secure such reorganization in a number of states, by laws permitting of the consolidation of scattered small schools into a single central school, with the provision of transportation for the pupils. (See CONSOLIDATION OF SCHOOLS.) Wherever the population is dense enough to permit of consolidation, and where either the forces of conservatism are so weak or the system of school organization is so centralized as to make it possible to inaugurate the plan, substantial educational progress has been made. The plan is, however, difficult to inaugurate for the reason that it must be initiated and carried through by the votes of the residents of the rural districts themselves. This involves the overcoming of all of the forces of tradition and conservatism, and the stronger the district system of control, the less likely that consolidation will be inaugurated. Being devoid of any central oversight and control, too many unwise unions are likely to be formed, because they are too small, poorly arranged, or without relation to any comprehensive plan for the reorganization of rural education. Much better results would be secured, in many cases, if the county rather than the district were made the unit for action, and a comprehensive plan, worked out for the county as a whole, were first adopted as a guide to action. In states which use the township as the unit, and where consolidation takes place by townships, these difficulties are much less likely to occur, but even here a county plan possesses many advantages. (See COUNTY SYSTEM OF ADMINISTRATION; COUNTY BOARDS OF EDUCATION.) It is possible, by the adoption of a well-thought-out plan of action and with county oversight, so to reorganize the educational resources of any county as to secure maximum educational effectiveness at a minimum cost, and to provide country people with practically as good educational advantages as are possessed by city people. It would mean the making over of our rural schools by incorporating into their curricula the special advantages now enjoyed almost alone by the cities, and into their organization and management the best city administrative experience.

The plan, in its bare essentials, means the grouping of the schools of a county into from ten to twenty areas, or units, at each of which a central or union school is provided. By means of transportation the children are brought each day to this central school, and returned home each night. All of the one-room district schools are abandoned, and the property sold. With these schools would also go the army of district school trustees. At the concentrating points good schools are erected, planned with reference to future growth and needs. For each central school supplanting from five to a dozen district schools, according to the density of population, a small board of education is elected. A supervising principal and a corps of teachers is in charge of each school. In each central school the beginnings of high school work are offered, as well as instruction in agriculture, manual training, and the household arts. Certain of these central schools, strategically located, provide full high school instruction. Special supervisors and instructors, employed by the county school authorities, go from school to school, giving instruction in the special subjects. By a little forethought the central schools can be made centers for the community life of the area served. The educational resources of a county are thus marshaled in the most effective manner, and the struggling, isolated, and unsatisfactory little rural school, with its rural school problem, disappears from view.

Rural School Supervision. — The lack of close, adequate, and professional supervision for our rural schools is a matter of common complaint. The supervision which exists today, except in Massachusetts and in a few favored townships elsewhere and in some of the county-system (*q.v.*) states of the South, exists much more in name than in fact. The cities, with their superintendents, special supervisors, and supervising principals, look after the instruction with a care and a thoroughness almost unknown in rural schools. State laws generally require county superintendents to visit each school in the county at least once each year, but this is visitation, and not supervision. The peculiar nature of the county superintendent's office, the political basis of selection generally employed, and his many duties — clerical, financial, statistical, legal, and political — leave him little time for real supervision, and the number of scattered schools he has under his oversight makes any real supervision impossible. Yet the demand for close, adequate, and professional supervision for our rural schools cannot be resisted much longer. (See SUPERINTENDENT OF SCHOOLS, COUNTY.)

Attempts to solve the problem of providing adequate and professional supervision for the rural schools have been made along a number of lines. The county superintendents themselves have long desired to secure the appointment of deputies, but with little success. The continued complaints as to needed clerical and professional assistance and the low salaries give abundant evidence that the office of county superintendent has not as yet commended itself very strongly to the people because of its professional skill. Attempts have also been made to secure supervision by laws permitting groups of districts, or the schools of a township, to unite to employ a supervising principal. Massachusetts, with its town system and compulsory legislation, has provided good supervision, and stands unique among the states. New Jersey and Ohio have made some commendable headway in securing rural supervision under the township system (*q.v.*). In some of the Southern states good supervisory conditions have been secured under the county system of organization. (See COUNTY SYSTEM OF ADMINISTRATION; COUNTY BOARDS OF EDUCATION; and the state school systems of FLORIDA; LOUISIANA; MARYLAND.) In the district-system states, however, voluntary unions for supervision are almost unknown. United action by district school authorities is next to impossible, and little can be expected along this line. The conservatism, jealousies, lack of insight, and lack of impulses to unified action are too strong to be overcome. Without some central compelling authority, or some central initiative with a definite plan for action, which must be accepted or rejected, as in Minnesota (*q.v.*), little can be expected in a generation to come.

The solution of the problem of providing adequate and professional supervision for the rural schools, and the small village and town schools as well, lies in part in the same direction as that of the improvement of the rural schools themselves, viz. in making the county rather than the district the unit, and in a thorough reorganization of rural education. With the divorce of the office of county superintendent from politics (see SUPERINTENDENT OF SCHOOLS, COUNTY) and with the adoption of a rational and effective system of county school administration (see COUNTY BOARDS OF EDUCATION; COUNTY SCHOOL ADMINISTRATION) it is possible to provide a sufficient professional supervising staff to supervise adequately and effectively all of the rural schools of a county. The more nearly the city plan of organization is copied by the counties, the more effective will the supervision become. In counties where the township unit prevails, or in counties where a comprehensive plan for the reorganization of a county's educational system is first adopted, the supervising principal of the township or central schools may take the place, in large part, of the deputy county superintendents. Each supervises his own union or central or township school, and coöperates with the county superintendent to secure a proper integration and correlation of the educational forces of the county.

So far as possible, the supervisory force should identify themselves with the needs and interests of the parts of the county which they are to supervise, and render whatever assistance is possible in molding community sentiment with reference to education. In emergencies it ought to be possible for a supervisor to spend days at a time at a school. It should be his particular business to try to make good teachers out of the material at hand; to single out bright and promising teachers and encourage them to go for further study; to guide the schools in organization and management; to hold teachers' meetings for the discussion of purposes, methods, and results; and to strive to develop the educational system of his county as fast as the people can afford and as is consistent with sound education.

The county supervisory system is weak in almost every Northern and Western state, because of the political nature of the office, because of the lack of adequate and professional assistance, and, in many of the states, because of the strength of the old district system, with its jealousies and lack of insight into educational needs. With the county, or even the township, as the educational unit instead of the district, the way is open for effective legislation, and good supervision for the rural schools, as well as for city schools, is attainable. Compared with countries such as France or Germany, where rural school supervision is a highly professional piece of work, we have little to show. In both France and Germany the position is given only to those who have had careful professional training, who have served a good apprenticeship, and who have won their positions on examination. Appointments are then made only on the basis of ability to do the work; there is no change, except promotion, so long as satisfactory service is rendered; and the supervision is close, personal, and effective. E. P. C.

See also Agricultural Education, section on *Agriculture in the Lower Schools.*

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RUSH, BENJAMIN (1745–1813). — Founder of Dickinson College; was graduated from Princeton in 1760 and subsequently studied medicine at the University of Edinburgh. He was professor in the Philadelphia Medical College; surgeon in the navy during the Revolutionary War; one of the signers of the Declaration of Independence; active in the establishment of the common school system of Pennsylvania, and the acknowledged founder of Dickinson College (1783). His publications include: *Essays on the Mode of Education proper to a Republic* (1786), *Charity Schools* (1796), *Moral and Philosophical Essays* (1798), *Diseases of the Mind* (1813), and many works on medical and other scientific subjects. W. S. M.

RUSKIN, JOHN (1819–1900). — Toward the close of his life, and increasingly since, characterized as "teacher and prophet." One of the greatest masters of English prose, his whole work was educational, either as interpreter of art or as social reformer. He also wrote much on various aspects of educational theory and practice, full of luminous and productive ideas. For twelve years he was Professor of Fine Art at Oxford; also for years a guide and instructor in the Workingmen's College in London; an indefatigable lecturer on educational topics before school, college, and public audiences; a school trustee; and in various ways eager in this field, in which he was a pioneer and in which his teaching has been most fruitful.

Ruskin's own education was irregular. But, beginning at the age of three, he made many tours with his parents through England, Scotland, Wales, and the Continent; to Paris, Brussels, Waterloo, at six; down the Rhine, Switzerland, Italy, twice before he entered Oxford; visiting castles, cathedrals, art galleries ("the real cause of the bias of my after life . . . my father had a rare love for pictures"), observing the lakes and mountains, developing that love for nature and for art, which, as Bosanquet has said in his *History of Æsthetic,* enabled Ruskin to give the mind of man a new organ for the appreciation of beauty.

From 1843 (Vol. I of *The Modern Painters*) to 1860 Ruskin was an interpreter of art and of its relation to life; from 1860 to the end he was a social reformer as well, or, indeed, chiefly. In 1860 appeared Vol. V. of *The Modern Painters;* also, in the *Cornhill Magazine,* four essays on political economy, later known as *Unto this Last*, in which an appeal was made for a new social order based upon social justice and a recognition of the brotherhood of man — an appeal rejected by the England of that day with bitter scorn. This year, 1860, was the beginning of "the days of reprobation," the days when the hitherto acceptable interpreter of delightful art, recognized as having "attained the proud position of one of the greatest of all writers, living or dead, on the subject of art," was assailed with violent reprobation as a heretic and interloper, — though shortly after his death at the beginning of the new century the Regius Professor of Political Economy in the University of Oxford could say, "The political economy of to-day is the political economy of John Ruskin, and not the political economy of John Bright or of John Stuart Mill."

That the art critic should give thought to the possibility of social justice and to the reform of education was not so much a change as a development. The germ at least of his later social doctrine was contained in his early art criticism. In an early volume of *The Modern Painters* Ruskin had declared, "Humanity is at once the standard and the end of art." In *The Seven Lamps of Architecture* (1849) he wrote, "The right question to ask respecting all ornament is simply this, 'Was it done with enjoyment — was the carver happy while he was about it?'" The chapter on the Nature of the Gothic in *The Stones of Venice* (1853) is an exposition of the relation between art and the life of the workman. Gothic architecture by its irregularity permits the workman to express the thought, not of an architect, but of himself, and he can therefore find joy in his work. By 1857 (*The Political Economy of Art*), however, Ruskin had come to the sorrowful conviction that, on account of the degradation of the operative into a machine in factory production, no art (and indeed no noble life) was possible in England under the existing social and industrial system, and by 1860 he was considering, as may be seen in the closing pages of *The Modern Painters*, how far he could "with any inward satisfaction pursue the cultivation of the beautiful in art without first endeavoring to realize the good and beautiful in the world of social and political life" (Cook, *Life of John Ruskin* 1911). It was inevitable that this interpreter of art should become a social reformer. His progress was accelerated by the influence of Thomas Carlyle, who was to the end his mentor and revered master.

Ruskin's discussions of educational theory and practice are everywhere in his works — a paragraph or two only, it may be, or many paragraphs. A good index to *Fors*, for example, contains about two hundred references to distinctively educational topics. Vol. XXXIX, *i.e.* the index volume, of the new library edition (George Allen and Co., London, 1912), is invaluable to one who wishes to know thoroughly the details of Ruskin's educational teaching. But his educational doctrine can in no wise be understood except in connection with the social and economic doctrines to which he had by 1860 definitely committed himself, for the subject matter of education and its methods are determined by the goal or end in view.

What, then, is to Ruskin the end in view? Certainly not a preparation for or an aid to success in life, as ordinarily understood — not at all education for the sake of "getting on" in the world. This low ideal, says Ruskin, poisons education at its source. Better no education at all than one with this false and vicious goal. The aim should not be to give some laboring men the chance of becoming masters of other laboring men, to help the few at the expense of the many. Ruskin was now, it will be remembered, attacking (successfully) the fundamental conceptions of the Manchester school of political economy, upon which was based the (at that time) prevailing brutal, inhuman, infidel, competitive system. In *Fors* he speaks of "the deliberate blasphemy" of Adam Smith's, "Thou shalt hate the Lord thy God, damn His laws, and covet thy neighbor's goods." But the question for a nation, says Ruskin, is not how much labor it employs, but how much life it produces. There is no wealth but life. That country is the richest which nourishes the greatest number of noble and happy human beings. Since there is no wealth but life, the manufacture of souls of good quality should be England's great concern, in her industrial activities even, and in her schools as a matter of course. This is the keynote of Ruskin's educational doctrine — the manufacture of souls of a good quality is the end in view.

Education is then an ethical process mainly, not an intellectual. Pupils must be taught habits of gentleness and courtesy and honesty. The best means is to teach them to *do* something, to set them to *useful* work (this treated of largely — for grown people also), set the girls to cook and sew, the boys to plowing and carpenter work. Schools should be in open places with abundant air and light, with beautiful surroundings and beautiful rooms, with portraits of noble men on the walls, with gardens, playgrounds, and cultivable lands around, with workshops, and a children's library, where the children, *if they care to do so*, may learn to read, each helping the other without troubling their master (this last intended for those who held that the three R's constituted the education properly furnished by the state). The schools should teach habits of worship. We live by admiration, hope, and love. There is consideration of the effect of beautiful nature on character, of the outdoor classroom, of music and dancing, as far more important than the three R's. Above all, the pupil must be induced to work for work's sake, not to surpass his fellows; let *nothing* be done through strife or vainglory, nor as a concession to the madness of the prevailing cram and examination system with its inevitable damage to health and character. In education there should be *no* selfish emulation, no self-seeking, no prizes gained by competitive examinations, and especially no "payment by results"; in short, *almost nothing* should be done in the schools which at that time was done, but most of which is now done no more.

Thomas Carlyle wrote to his brother Dr. John Carlyle, Feb. 24, 1872, "I am reading Ruskin's books in the evenings; . . . I find a real spiritual comfort in the noble fire, wrath, and inexorability with which he smites upon all base things and widespread public delusions; and insists relentlessly on having the ideal aimed at everywhere." Happily, the ideal aimed at by Ruskin has in many respects been realized. On his eightieth birthday an address was sent him signed by many of the names known in the English-speaking world, "Year by year, in ever widening extent, there is an increasing trust in your teaching, an increasing desire to realize the noble ideals you have set before mankind in words which we feel have brought nearer to our hearts the kingdom of God upon earth." His biographer, Collingwood, wrote in 1893, "His works have not been popularized abroad by translations." But his latest biographer, E. T. Cook, writes in 1911: "Since the days when he laid down his pen, he has ceased to be only an English author and has become a world author. Many of his books have been translated into French, German, Italian, Spanish, Swedish, Hungarian . . . (his) writings have been the subject also of essays or treatises in Belgium, in Holland, in Denmark, in Switzerland." R. J.

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RUSSELL, LORD JOHN (1792–1878). — English statesman, born at Westminster. Owing to delicate health he received the greater part of his early education privately, although he did attend Westminster School for one year (1803–1804). After a year of travel he entered Edinburgh University in 1809 and remained three years. In 1813, while still under age, he was elected member of Parliament for Tavistock in the Whig interest and continued in politics until within a few years of his death. From the first he was actively identified with all movements in the direction of democratic reform — the better control of elections, the abolition of religious disabilities, improved poor laws, reduction of capital punishment, and parliamentary reform. In 1831 he moved for the first reading of the Reform Bill. By 1834 he was recognized as the leader of the Whig party. In 1838 he was responsible for a bill to establish a Committee of the Privy Council to deal with education, involving the distribution of the grant of £30,000 and government inspection of schools, — thus introducing for the first time the idea of state control of education based on a state grant. In a speech on the Government Plan for Promoting National Education (June 30, 1839) he declared himself opposed to the claim of the Established Church to have sole control of state funds for education, but at the same time did not think it was possible to supersede the work of voluntary agencies. (He was himself a member of the British and Foreign School Society). He severely criticized the prevailing system of education as "a certain degree of instruction which enables the pupils to read and to write and to cypher, but it does not affect the hearts and the minds of the people instructed." The business of education is "to give such instruction as will excite the intelligence of children, raise their curiosity, teach them the meaning of words, and implant in their hearts those doctrines which are to be their guide through life." He drew attention to new methods of education which do not burden the memory and render learning irksome and disagreeable but awaken intelligence. "The only permanent security of the country is to be found in the general knowledge of the people as well of their religious duties as of their moral obligations. . . ." A compromise had, however, to be made with the Church: the inspectors of National schools were to be appointed with the consent of the bishops to whom, as well as the Committee of the Privy Council, reports on the school were to be sent. The proposal to create an interdenominational normal school was defeated. From 1846 to 1851 Lord Russell was Prime Minister. In 1847, at Lord Russell's suggestion, paid pupil teachers were introduced in place of unpaid monitors and the training colleges were opened to them, while government grants in addition to salary were given to trained teachers. In 1853, as President of the Privy Council, Lord Russell brought in a measure, doomed to defeat, to increase the number of inspectors, to raise the standard of education, and to allow local authorities to levy a school rate, while parents were to be permitted to have a voice in the religious education of their children. At this time, while half the children of school age in the country were receiving instruction, not more than one eighth were in schools subject to inspection, that is, maintaining some standard of efficiency. In 1870, when Forster's bill was introduced, Lord Russell, though in favor of simple Bible reading with simple explanation and opposed to what he regarded as taxing Dissenters to support Church schools, gave it his support. In *Some Thoughts on National Education* he declared himself in favor of a free state-provided system of education on the model of that of Massachusetts, in which he was interested. In *Some Further Thoughts on National Education* he drew attention to the need of measures to secure better attendance and the retention of pupils until the age of fourteen, and advocated an enriched curriculum, including beyond the three R's, history, geography, the formation of taste and mechanical skill, and fostering the desire to read. Lord Russell's service to English education can best be summed up by quoting from a letter written to him by Forster in 1870: "As regards universal compulsory education, I believe we shall soon complete the building. It is hard to see how there would have been a building to complete, if you had not with great labor and in great difficulty dug the foundations in 1839."

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RUSSELL, WILLIAM (1798–1874). — Teacher and educational writer; educated in the schools of Scotland and at the University of Glasgow. He came to America in 1817 to accept a position in an academy at Savannah, Ga. After teaching for a few years in the South, he accepted a post in the Hopkins Grammar School at New Haven. He was later simultaneously instructor of elocution and oratory in the theological seminaries at Andover and Cambridge. He established in 1826 the *American Journal of Education*, a high-grade educational review. Excepting the short-lived *Academician*, this was the first noteworthy attempt at educational journalism in the United States. (See Journalism, Educational.)

Mr. Russell was keenly interested in the higher education of women and the organization of training schools for teachers. In 1849 he opened a private normal school at Lancaster, Mass., along Pestalozzian lines. He brought from England as instructors in his newly organized institution William J. Whittaker, a well-known art instructor, and afterwards the principal of the first normal art school in the United States, and Herman Krüsi, Jr. (*q.v.*), the Pestalozzian. Dana P. Colburn (*q.v.*), author of a series of Pestalozzian arithmetics, and Sanborn Tenny (*q.v.*), author of books on natural history, formed the remainder of the teaching staff. The state normal schools in Massachusetts superseded the private establishments for the training of teachers; and Mr. Russell closed his institution in 1857 and devoted his closing years to lecture and literary work.

He was for many years institute lecturer in Massachusetts and Rhode Island, and took an active part in the early American educational associations. He published several manuals for teachers, a number of works on elocution and oratory; a series of school readers, and many papers on the education of women, mutual instruction, and other educational subjects. W. S. M.

See Journalism, Educational.

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RUSSIA. — Population and Government. — Public instruction in Russia presents unparalleled difficulties by reason of the vast population to be reached and its varying conditions. According to the estimates of the Statistical Commission in 1910, the Empire comprised 163,778,400 people and an area of 8,330,000 square miles (not including the inland waters). Russia in Europe, with an area less than one fourth the total, had more than four fifths of the population, viz.: 135,859,400, or 68 inhabitants to a square mile. The Asiatic population was 24,889,000 distributed over a vast region having an average of four inhabitants to a square mile. Finland, (*q.v.*) which until very recently was treated as an allied province, had an additional population of 3,030,000. The distinction between urban and rural populations is marked in regard to all civil affairs; but there are comparatively few large cities, only twenty with more than 100,000 inhabitants each. The immense rural population, 84 per cent of the total, is collected as a rule in small villages, and the community life forms an important feature of the social organization. Of the entire population 69.9 per cent are adherents of the Greek Church.

The government of Russia is autocratic with limitations upon the authority of the Emperor imposed by the Duma which, under imperial decree of August 6, 1905, was constituted an elective assembly with restricted legislative rights. Subsequent orders of March 6, 1906, provided that the Council of the Empire should consist of an equal number of elected members and members appointed by the Emperor, and should exercise equal legislative power with the Duma.

The divisions of the Empire for local administration are governments (78); provinces (21); and one circuit, that of Sukhum in the Caucasus. The chief executives of these divisions and the subdivisions are not, as a rule, directly concerned with educational affairs, which have a distinct organization. The peasant communities exercise a measure of local self-government through the village assemblies, *mirs*, and the assemblies of the *volosts* (cantons). Poland, the Baltic provinces, and Finland long preserved their own administrations, but they are being rapidly assimilated into the Imperial system.

Distinctive Characteristics. — Russia offers a striking contrast to other nations of Europe not only in its government but in the conditions of its intellectual development. The nations of Central and Western Europe may be studied from the standpoint of a common history, as regards their political and spiritual origins, but Russia has reached its present degree of civilization by a course peculiar to itself. While in neighboring nations there has been a steady growth in popular liberty and the restriction of imperial power, the Russian people have remained in absolute dependence upon an autocratic ruler; at the same time, the Christian religion, which in Western Europe has liberalized men's thinking, has conduced in Russia to pious superstition. The Mongolian invasion kept the country for two centuries (1224 to 1481) subject to the barbarians; the work of civilization ceased, and when the invaders were finally driven out, they left the stamp of their despotic nature upon the Russian nobles. The ignorance of the people is proved by the fact that many of the clergy, even, could not read or write. This was the complaint of the Archbishop Ghennadi to the Metropolitan, Symon, at the close of the fifteenth century. It was necessary to ordain illiterate candidates who could repeat the Psalter from memory, in order that the chants might not cease in the churches nor Christians die without absolution.

Educational Foundations. — Peter the Great became sole ruler of the Empire in 1689 and immediately entered upon vast projects for its development. His educational plans bear a striking likeness to those which Napoleon later urged for France. Both esteemed education for its practical uses and provided for special schools to train experts for the public works which they projected. The Czar created a naval academy and engineering and artillery schools, drawing the teachers largely from Great Britain. He also established lower schools known as "cypher" or arithmetic schools from the prominence given to that branch. Attendance upon these schools was obligatory for the children of noble families, all of whom were expected to serve the State in some capacity. The Church had always maintained schools for the clergy, and under an imperial order of 1721 these diocesan schools rapidly multiplied and drew students from the classes for which the arithmetic or "cypher" schools were intended; the latter declined before their more popular rivals and disappeared entirely by the middle of the eighteenth century.

The Emperor's purpose to provide an ample corps of trained experts for the public service was shown also by his sending young men of noble birth or of unusual promise to study in the higher institutions of Germany and Great Britain. At the same time he emulated the example of France and Germany by plans for an academy of sciences at St. Petersburg, which he had made his capital. The project of the academy was interrupted by his death, which occurred in 1725, but the following year the academy was formally opened by his widow and successor, Catherine, who gave it liberal endowment. The plan of the institution had been developed in advice with the eminent scientists Wolff and Leibnitz, and it comprised both an academy or association of learned men and a teaching gymnasium. The latter was organized after German models and staffed with German teachers. The institution was greatly in advance of the age in Russia, the gymnasium students were few, and the academy long depended upon foreigners for its current activities; but from the first it fulfilled two great purposes: it maintained the idea of intellectual standards in an indifferent age, and it brought Russia into the culture movement of Europe. The reaction against German influences carried Elizabeth, the daughter of Peter the Great, to the throne, and at the suggestion of Lomonosov, called the father of Russian literature, this Empress founded the University of Moscow, 1755. It comprised faculties of law, medicine, and philosophy, and the attendance of students, poor but promising, was encouraged by government scholarships. The purpose of the government to bring all education under central control was indicated by a ukase issued April 29, 1757, two years after the founding of the University, ordering all foreigners desiring to teach in Russia to submit to examination at the Academy in St. Petersburg or at the University of Moscow.

The movement begun by Peter the Great, which broke up the intellectual isolation of Russia, was completed by the Empress Catherine II. At the time of her accession, 1763, the Empress was under French influences; she corresponded with Voltaire and Diderot and absorbed educational ideas from Montaigne and Rousseau, modified by the practical teachings of Basedow and Locke. The effect is seen in her plans for a school system as extensive as the Empire. In 1775 a statute for the "organization of the provinces" provided for the foundation of a charity committee in each province charged to establish schools in all the cities and populous places; in 1782 the Empress instituted a commission to develop a complete system of primary schools, including their organization, program, and textbooks, and also normal schools for the training of teachers; in 1786 the recommendations of the commission received imperial sanction. In this action the Empress was influenced by the example of Austria. Upon the advice of Joseph, the successor of Maria Theresa, she had induced Jankoviez de Mirievo, who had been the associate of Felbiger in the reform of the schools of Austria-Hungary, to come to Russia to assist the school commission; consequently the beginnings of popular education in the Empire were associated with the same movement in Central Europe. The Empress Catherine also established an important school for girls at Smolny Monastery, and a "cadet school" for young men of the higher classes; both these institutions embodied her own ideas as to the appropriate training for either sex. At the same time she continued the work of her predecessor by establishing technical schools of high grade.

The Constructive Period. — Broadly speaking, the history of education in the Empire from the close of Catherine's reign to 1863 is the history of a struggle between two opposing principles — the autonomy of institutions *versus* autocratic government. This struggle is epitomized in the principal measures pertaining to the universities and secondary schools during the first half of the nineteenth century for, with the exception of a few general regulations, primary, or popular, education excited little attention during this constructive period.

Alexander I, who ascended the throne in 1801, had acquired liberal ideas from his Swiss tutor, La Harpe, and his scheme of government included a general system of public instruction. In 1802 he replaced the Schools Commission by a "Ministry of Popular Enlightenment," and to this body the control of public education, with the exception of a few institutions, was committed. The following year the country was organized into educational districts with a curator appointed by the Emperor at the head of each. The complete plan formulated in 1804 provided for a university in each district. The three existing universities, Moscow, Vilna (in the Polish province), and Dorpat, and the new universities, two of which, Kharkov and Kazan, were founded at once, were endowed with a large measure of independence, the university councils, comprising professors and assistant professors, being the governing bodies. A striking feature of the plan was the relation established between the primary and secondary schools (gymnasia), which together comprised a seven years' course of study complete in itself.

The French invasion of 1812 and the fears excited by the Napoleonic wars produced a revulsion of feeling even in the Emperor himself. In the reaction which followed, liberal policies were abandoned, the ministry of public instruction was administratively combined with the Holy Synod (1817), ecclesiastical restrictions interfered with scholastic freedom, and the university councils were subordinated to the curators of the districts. All agencies of private instruction were closely scrutinized, and the Jesuits, whose schools had become popular with the nobility, were banished. The intellectual advance of the higher classes is indicated by an undercurrent of opposition to these restrictions, which resulted in concessions to special institutions with respect to the right of entry into the public service. Among these were the Alexander Lyceum, the Pedagogical Institute of St. Petersburg, the High School in that city, and six schools of the same type in other cities. The ancient university of Moscow escaped many of the repressive measures, as did the universities of Vilna and Dorpat, which served non-Russian populations.

The reactionary movement received fresh impulse from the Emperor Nicholas I, who succeeded his brother Alexander in 1825. The new ruler was an autocrat by temper and conviction and this natural disposition was intensified by the revolution, which broke out soon after his accession. His reign was marked by an extension of absolute authority in every direction and the increasing complexity of the bureaucratic system. The statute of December 8, 1828, relating to gymnasia and primary schools, broke up the continuity of their courses of study and limited the latter to elementary branches suited to the humblest classes; the maintenance of social distinctions and imperial ends was made a definite purpose of education; and the curricula and internal affairs of the gymnasia were placed under state inspection. Regulations of 1833–1834 provided for the state supervision of private instruction, and by a statute of 1835 the control of the district curators over the universities was extended.

Notwithstanding this repressive policy, the efficiency of secondary and higher education in Russia increased, a result which is attributed to the wisdom and force of Uvarov, who was Minister of Public Instruction from 1833 to 1849. Of this official, it is said that while "working in entire accord with the general aims of the Emperor's policy, he was yet able by wise and liberal methods of administration to temper, within certain limits, the rigidity of the bureaucratic régime."

In striking contrast with the suppression of university life during this period was the outburst of intellectual activity, which in part was literary and national and in part speculative and of foreign origin. The latter phase was inspired largely by young professors who had studied in Western institutions and who brought back to Russia transforming influences — from France, new social doctrines, from Germany, the philosophic conceptions of Schelling and Hegel. The University of Moscow was the center of the new ideas and the seat of the celebrated controversy between Slavophils and the advocates of Western culture. It was in vain that the Emperor increased the restrictions upon the universities and established a censorship over the instruction and lectures, as well as over the books and periodicals which the universities received; the ferment of ideas went on outside the universities, and the learned world was at variance with court and officials.

Reform Movements. — The Emperor Nicholas died in 1855 just at the close of the Crimean War, which had combined with his stern policies to defer a threatening crisis in the internal affairs of the Empire. His son and successor, Alexander II, brought to the solution of the imperial problems a spirit entirely unlike that of his father, and his earliest measures showed full sympathy with the social aspirations and intellectual purposes of the liberal movement. Against the opposition of the court circle he issued the decree for the liberation of the serfs, February 19, 1861. This radical measure, which won for him the title of the "Czar Liberator," broke up the social order that had prevailed under sanction of law for nearly three centuries and had determined judicial and administrative processes.

The immediate effect of the emancipation act was disastrous from the economic standpoint. A vast body of people, variously estimated from ten million to twenty million, for the most part densely ignorant and unused to civil rights, was suddenly added to the illiterate mass of freemen, for it was estimated that, at the time, less than 1 per cent of the entire population (78,000,000) was under instruction. The act also seriously affected the smaller landed gentry, who were deprived of their possessions and their sons forced to enter the industrial world. It was necessary, therefore, to provide a system of primary education as extended as the nation, and to increase the provision and the adjustments of secondary and higher education. At the same time, the problem of university administration demanded attention.

The university statute of 1863 restored authority to the university councils and, the following year, a scheme for the reorganization of the secondary schools and a primary school law were sanctioned. The three measures while differing in purpose all showed a decentralizing tendency, but events soon forced the Emperor to abandon his purposes.

At the moment when the spirit of reform was at its height its ardors were dampened by the Polish insurrection of 1861, and in the reaction which followed the first burst of liberal enthusiasm, the forces of discontent freed from old restraints became rampant. In the confusion which followed, student bodies were largely implicated, and the University of St. Petersburg was temporarily closed by reason of the excessive disorders. A reign of terror ensued, and under the instinct of self-preservation the government resumed a repressive policy. In 1866 Count Dmitri Tolstoy was appointed minister of public instruction, and extreme centralization again destroyed the principle of free activity. This course was confirmed by the University Commission, created by the Emperor Alexander in 1874. Finally, following the tragic circumstances of the Emperor's death, the statute of 1884 deprived the universities of the last vestige of authority. The district curators were given full control, including the appointment of the university rectors, the professors, and the deans of the faculties. This measure, adopted on account of the alarming spread of revolutionary ideas among the educated youth of Russia, failed to correct the evil; it merely repressed the intellectual life of the universities. Protests arose from every side, and after a decade of strife a provisionary measure of 1905 restored the government of the universities to their respective councils.

Effect of Changing Policies upon Secondary Schools. — In the changes from liberal to repressive policies secondary schools passed alternately from the control of the district curators to that of the university councils; at the same time the curriculum was the subject of successive changes of peculiar significance. By the statute of 1828, the gymnasia (typical secondary schools) had been made the preparatory stage of the universities, and in accordance with the advice of Minister Uvarov, all speculative studies were eliminated from their program, being relegated to the universities, and Latin and Greek raised to the central place. The revolution of 1848, which convulsed Western Europe, found ardent sympathizers in Russia, especially among students, and consequently classical studies then fell under suspicion as a fruitful cause of democratic sentiments; at the close of his ministry, Uvarov put his signature to an act reversing his own policy. This was the ordinance of 1849 under which the secondary program was organized in three parallel courses. Of these courses, one alone required Latin, while Greek was confined to students intending to specialize in philology. The imperial commission on secondary schools appointed by Alexander II in 1869 restored the classics to their former place, as a corrective to excessive materialism and the frightful spirit of nihilism which possessed Russian students. By a law of July, 1871, the tripartite scheme of the gymnasia was abandoned, and by a supplementary law, 1872, *real* schools were created, nonclassical schools of a thoroughly modern type. The latest revised curriculum for the gymnasia allots 33⅓ per cent of the time to Latin and Greek. The *real* schools are wholly modern. In connection with these successive measures, the question of the classics *versus* science was exhaustively considered, with an emphasis upon its political bearings unique in the history of that controversy.

Education of Women. — The movement for the education of young women started by Catherine II has been steadily fostered by the government and has had profound effect upon the development of the higher and professional classes of society. The Emperor Paul, son and successor of Catherine, placed the schools for women under the patronage of his wife, the Empress Maria Feodorovna, and after her death (1825) they were committed to a special administration. In 1870 the schools were classified as gymnasia, having a seven years' course without Latin or Greek, and progymnasia with a course of three or more years. One outcome of this provision was the struggle for university privileges which in its progress drove scores of young Russian women to the universities of France and Switzerland, where they became enthused with the spirit of liberty and returning gave new impulse to the revolutionary movement in Russia. As a means of counteracting this evil, the government provided courses of lectures for women at university centers. These finally developed into systematic courses of study with entrance examinations and standards of graduation. The last concession was the provision of medical instruction leading to a professional diploma for women.

Primary Schools. — In the history of education in Russia, the primary school law of 1864 stands as the most important piece of constructive legislation, both in contrast with previous legislation on the subject (laws of 1804 and 1828), and in relation to other measures that grew out of the emancipation act. The redistribution of the land, the new judicial system, the zemstvos or organs of local self-government, all were seen to be dependent for their success upon the spread of popular intelligence. The new law was intended to conserve and unify the existing agencies for that purpose. It authorized the union of schools of different denominations into a single group; required the admission of all children without distinction of creed, rank, or sex, unless separate schools were provided, and prescribed a common program for the schools, which included the three elementary branches, church, singing, and religion. The religious instruction was expressly assigned to the parish priest or to a special instructor approved by the district school council with clerical agreement. The Russian language alone was recognized as the medium of instruction. The zemstvos were authorized to establish and support public schools, but their control was committed to the district councils formed by the central authority. These councils, however, included representatives of the zemstvos. Modifications of the law of 1864 have increased the central control over the primary schools of all classes.

Extensions of the system of primary education have been made as follows: In 1872 a law was passed providing for the establishment of urban schools and the gradual transformation of the "district" schools authorized by law of 1828 into schools of the new type. The course of study for the urban schools was extended to six years or double the term of the ordinary primary school, and comprised besides religion and the three elementary branches geometry, history, and geography, elements of natural science and physics, drawing, singing, gymnastics, and additional subjects, if approved by the Minister. These schools, which might be supported by the government, or by local authorities, correspond to the higher primary schools of France.

Sunday schools intended for secular instruction and financed entirely by voluntary subscription, were recognized by the law of 1864 as part of the provision for primary education. Training seminaries or normal schools for teachers have also been established by the different authorities in conduct of primary education. Among the best of these institutions are those maintained by the local zemstvos.

Finally should be mentioned the statute of 1884 secured by M. Pobedonostsev, High Procurator of the Holy Synod, which virtually created side by side with the primary schools of the zemstvos a system of parochial primary schools. In 1891 the control of the synod was extended to the peasants' home schools, a provision for teaching the rudiments in isolated parishes, and also the Sunday schools not connected with public day schools.

Education is not compulsory, excepting in the Lutheran parishes of the Baltic districts; a bill submitted to the Council of the Empire in 1911, and still under discussion, provides for universal free instruction with compulsory conditions.

The limitations upon the expenditures of the zemstvos and the steady increase of the functions of the Holy Synod in respect to primary education are due to the same causes that have prevented the free development of higher education in the Empire. An imperial government necessarily fears freedom in even the lowest grade of education; nevertheless the exercise by the zemstvos of their rights in respect to primary schools, and the local enterprise encouraged by the ministries of commerce and agriculture are from the modern standpoint the chief facts in the recent educational movements in Russia. Their importance cannot yet be measured by statistics, but they are instinct with the spirit of national life in the fullest sense of the word.

Present Conditions. — The present state of public education, comprising the general system with its various divisions and the supplementary technical divisions, is here summarized.

Organization. — The central authorities for education are: the Ministry of Public Instruction; The Holy Synod; the Department of the Institution of Empress Maria, and the Ministry of Finance. Other ministries, war, agriculture, etc., are responsible for special classes of schools. The Empire is organized into twelve educational districts in charge each of a curator appointed by the Emperor upon the nomination of the minister. In areas not included in these districts the governors-general control educational matters. There is also a service of inspection carried out by the district inspectors, who are nominally subordinate to the curators, but derive their authority from the minister and report directly to him. They are members of the curators' councils, which include also school directors and, when the affairs of higher educatiou are considered, representatives of the universities.

Local initiative and independence have so far had little part in the work of public instruction; the basis for such activities is afforded, however, by the *zemstvos* or district and provincial assemblies created in 1864 as a feature of the social reorganization growing out of the liberation of the serfs. Their rôle was greatly restricted by a law of 1874 and amounts to little more than providing schools over which they have very limited supervision. Moreover, the zemstvos exist in only thirty-four of the seventy-eight governments, and their decisions are jealously scrutinized by the local governors and are liable to be annulled if they are not in harmony with the spirit of the court. Nevertheless, these local bodies have done much to promote schools and especially those having an agricultural character. The municipal asemblies (local dumas) have limited authority over city schools. The mir or village community has a voice in respect to school expenditures. The Holy Synod is the supreme authority in ecclesiastical affairs, but subject to the Emperor in respect to its organization and its civil activities. This body has charge of parochial schools, which are parallel with, and to a certain extent antagonistic to, the schools supported by the zemstvos. In 1891 the peasants' home schools (*shkoly gramotnosti*) were also placed under the Holy Synod.

The Minister of Finance not only has charge of commercial schools, but is brought into close relation with the public elementary schools by the authority given him in 1900 to limit the expenditure of the zemstvos for their schools.

The Hebrews and other religious sects maintain their own schools as a rule; finally it should be stated that the schools of Russian Poland are separately organized; the Lutherans of the Baltic provinces long resisted all attempts to interfere with their school system, but they have gradually been brought under central control; Finland has its separate system of public instruction, much more highly developed than that of Russia. (See Finland; Poland.)

Statistical Summary. — On account of the vast extent and varied conditions of the Empire, as well as the number of central authorities charged with the control of education, it is impossible to obtain for a given year an exact account of the educational provision of the Empire. The latest report of the Minister of Public Instruction, issued in 1911, comprises all the higher institutions excepting the theological seminaries pertaining to different denominations, a few technical schools belonging to other ministries, 87 per cent of the middle schools of all classes, and 67 per cent of the primary schools of the Empire. The primary schools of the Holy Synod bear about the same relation to the schools of the ministry that the church schools of England bear to the public schools, but the Synod receives the government appropriation directly and manages its schools through the bishops and local clergy. The following general summary is derived from the minister's report, supplemented by the latest particulars from other administrations. The detailed tables relate entirely to the province of the ministry.

The number of students in higher institutions in 1910 was 66,195, distributed as follows: universities and special schools of university grade, 43,690; university courses and medical institute for women, 10,576; higher technical schools, 11,929.

In middle schools of all classes, including gymnasia, teachers' seminaries, middle technical schools, etc., there were 615,937 pupils. The public primary schools and church schools enrolled 6,282,571 pupils. This total, which does not include Mohammedan and

Hebrew schools, was equivalent to 3.8 per cent of the school population. The Hebrew schools of all grades reported for 1910 a total of 181,944 pupils, and private schools, 219,745. Hence in schools below the university grade there was a grand total of 7,300,000 pupils.

The expenditure for higher education amounted to 12,418,314 roubles ($6,395,432), of which the government provided 50.7 per cent. The expenditure for middle schools, so far as reported, was 43,453,278 roubles ($22,378,438), of which the government bore 31 per cent; for primary schools under the ministry of public instruction the expenditure was 63,408,240 roubles, the government supplying 72 per cent.

The government appropriation for education increased from 42,920,000 roubles in 1904 to 91,694,000 roubles in 1911.

The expenditure by the Holy Synod for religious and educational purposes in 1911 amounted to 37,567,000 roubles. The steady increase in the appropriations to the Holy Synod is intended to expand its work in primary education.

UNIVERSITY STATISTICS, 1911

UNIVERSITIES	NUMBER OF PROFESSORS AND ASSISTANTS	NUMBER OF STUDENTS
European Russia —		
St. Petersburg	236	9,886
Moscow	673	10,399
Kharkov	216	4,473
Kasan	243	2,955
St. Vladimir in Kiev	231	5,208
Saratov	12	200
Novorossiysk (Odessa)	188	2,756
Siberia —		
Tomsk	100	1,300
The Kingdom of Poland —		
Warsaw	98	1,991
The Baltic Provinces —		
Yuryeff, formerly Dorpat	149	2,901
Grand total	2,146	42,069

About one tenth the university students are supported by bursaries or have their tuition fees remitted. The appropriations for this purpose amounted in 1910 to 575,045 roubles 98 copecks and financial assistance to 134,644 roubles 8 copecks.

DISTRIBUTION OF STUDENTS ACCORDING TO FACULTIES, SO FAR AS REPORTED, JANUARY 1, 1910

Divinity	125
Historical-philological faculty	3,376
Law	16,450
Mathematical science	4,132
Natural science	5,391
Medicine	8,966
Oriental languages	176
Grand total	38,616

Of the entire body of students, 72 per cent were adherents of the Greek Church. Hebrews, whose quota is strictly limited by law, furnished the next highest proportion, viz. 11 per cent; Roman Catholics followed with 7.4 per cent.

The special school of law, and the historical and philological institutes comprised, in 1910, 1621 students.

The women students of higher education were distributed as follows: —

SECTIONS	ST. PETERSBURG	MOSCOW	TOTAL
Historical-philological	2150	2383	4533
Physico-mathematical	1507	1318	2825
Law	625		625
Medicine	1618[1]	975	2593
	5900	4676	10,576

[1] Medical Institute.

The natural sciences have been greatly cultivated in Russia, and her savants have achieved distinction by their investigations in biology, chemistry, and physiology, as well as in the descriptive sciences pertaining to the vast territory of Russia. St. Petersburg and Moscow are the seats of the chief scientific associations. At the head of these is the Academy of Sciences, St. Petersburg; the Moscow Society of Naturalists and the Geographical Society, with its Caucasian and Siberian branches, are very active. The Emperor annually grants 50,000 roubles ($25,750) from his own funds to foster scientific research publications, etc. Vilna and Kieff are noted for their libraries and depositaries of ancient archives. The Imperial Clinical Institution of the Grand Duchess Elena Pavlovna at St. Petersburg has accommodation for 1208 resident patients and 69,363 ambulatory. The practical medical courses of this institution are attended by about 400 students annually.

STATISTICS OF THE HIGHER TECHNICAL SCHOOLS PERTAINING TO THE MINISTRY OF PUBLIC INSTRUCTION, 1911

TECHNICAL INSTITUTIONS *European Russia*	NUMBER OF PROFESSORS	NUMBER OF STUDENTS
St. Petersburg Technological Institute	106	2,300
Kharkov Technological Institute	71	1,400
Moscow Technical School	103	3,000
Siberia —		
Tomsk Technological Institute	72	1,346
Poland —		
Novo-Alexandriyski Institute of Agronomy and Forestry	47	600
The Baltic Provinces —		
Riga Polytechnical Institute	84	1,839
Grand total	483	10,485

There were also seven veterinary schools and institutes with a total of 1,444 students.

Technical Schools of Intermediate and Lower Grade. — The development of technical education on a broad scale and as a condition of national prosperity is intimately related to the emancipation of the serfs. That act itself was due in great measure to industrial demands which necessitated the freedom of the laboring class, and it was followed immediately by industrial expansion and a call for skilled labor and expert directive power. Technical schools sprang up in various centers and were placed under different ministers without regard to the general needs of the country. This period of isolated efforts was closed in 1881 by the transfer of this class of schools to the ministry of public instruction.

A special department to deal with the interest was constituted in the ministry in connection with the scientific committee, and in the plan of organization adopted, which received imperial sanction, March 7, 1888, the technical schools were classified as intermediate, based upon the secondary programs, and lower, following the primary schools, and differing also in the duration of the course of training. Provision was made for specialized trade schools. At the same time a commission was appointed to devise plans for the proper distribution of the different classes of technical schools.

TABULAR VIEW OF MIDDLE SCHOOLS, 1910

Class	Number	Number of Instructors and Directors	Number of Pupils	Expenditure	
				Total Roubles	United States Equivalent
Ministry of Public Instruction —					
Gymnasia	293	7977	111,828	15,784,646	$8,129,092.69
Progymnasia	35	503	6052		
Realschools	214	3466	63,085	7,554,229	3,890,427.94
Teachers' Institutes	15		1011	463,097	238,494.96
Teachers' Seminaries	87	1079	8254	2,500,613	1,287,815.69
Gymnasia for girls	590	17,886	219,731	14,721,001	7,581,315.52
Progymnasia for girls	117	1612	17,937		
Technical schools	68	1315	10,383	2,298,945	1,183,956.67
Empress Maria					
Middle schools	32		14,766	130,747 [1]	67,334.70
Institutes	36		9243		
Holy Synod (1908) —				[2]	
Seminaries	57		16,487		
Other middle schools	183		30,143		
Schools for Girls	73		23,241		
Total (reported)	1800	33,838	532,191	43,453,278	22.378,438.17

[1] For 19 schools registering 3266 pupils.

[2] Expenditures by Holy Synod are not itemized.

In addition to the middle schools included in the foregoing table, there are schools of the same grade under the ministry of war, which in 1908 had an enrollment of 18,591 pupils and Cossack schools enrolling about 9500 pupils. This would give a total of 539,539 pupils in schools intermediate between elementary schools and higher institutions, which are intended for general education either solely or combined with technical courses.

Parallel with the technical schools included in the table are the commercial schools under the recently organized ministry of commerce, and the schools of agriculture under the ministry of agriculture. The former numbered, in 1909, 350 schools with a registration of 74,398 pupils. The schools of agriculture form a complete system including 11 middle schools with about 2000 pupils. The inclusion of the students in these specialized schools would raise the total of pupils in the class of middle schools to 615,937.

SUMMARIZED STATISTICS OF PRIMARY SCHOOLS, 1910

Administration	Number of Schools	Number of Teachers	Number of Pupils	Expenditure	
				Roubles	United States Equivalents
Ministry of Public Instruction —					
Urban schools	5,572	133,796	4,204,910	63,408,240	$32,655,243
Rural schools	48,284				
Holy Synod	42,697	67,907	1,983,817		
Other ministries	1,432	2,414	69,145		
Associations	193	389	7,919		
Total (reported) [1]	98,178	204,506	6,265,791		

[1] Also 10,142 Mohammedan schools.

DISTRIBUTION OF PRIMARY SCHOOLS AMONG THE TWELVE EDUCATIONAL DISTRICTS AND THREE GOVERNMENTS, 1910

Educational Districts	Urban[1]	Rural[2]	Mohammedan		Total
			Mektebe	Medresse	
St. Petersburg	648	3,488	1	——	4,137
Moscow	959	9,422	19	1	10,401
Kharkov	460	5,592	109	13	6,174
Odessa	513	3,720	497	32	4,762
Kiev	262	3,668	——	——	3,930
Vilna	273	3,810	——	——	4,083
Kasan	497	4,596	1,347	401	6,841
Oremburg	227	2,950	1,051	417	4,645
Caucasus	362	2,204	——	——	2,567
Riga	253	2,395	——	——	2,648
Warsaw	677	3,290	——	——	3,967
Western Siberia	176	1,324	——	——	1,500
Irkutsk	129	954	9	——	1,092
Turkestan	94	183	5,892	353	6,522
The Amur	42	268	——	——	310
Total	5,572	48,284	8,925	1,217	63,797

[1] Graded in six classes.
[2] Ungraded one class schools with winter sessions only and programs covering a three years' course.

The instruction given in the rural primary schools is generally very elementary, but training in agriculture and in manual arts is common and as a rule is excellent in quality.

A. T. S. and Russian translator.

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RUST UNIVERSITY, HOLLY SPRINGS, MISS. — One of the Freedmen's Aid Society (*q.v.*) schools, under the management of the Methodist Episcopal Church. It was founded in 1876, largely through the influence of Dr. Richard S. Rust, who at that time was one of the most aggressive advocates of negro education in the country. The institution lays emphasis upon both literary and industrial training. (See Negro Education.) The school has about thirty teachers and from 400 to 500 students. It has sent out more than 400 graduates, who are to-day leaders of the negro race.

J. T. B.

RUTGERS COLLEGE, NEW BRUNSWICK, N.J. — Founded as Queen's College, November 10, 1766, by royal charter. A second charter, slightly amending the first, was granted by George III through William Franklin, governor of the Province of New Jersey, March 20, 1770. The college was called Queen's in honor of the royal consort, Charlotte. It was founded in response to a petition of the ministers and elders of the Reformed (Dutch) Church in America. The charter leaves the college non-sectarian, however, only providing that the president shall be communicant member of said church. In 1825 its name was changed to Rutgers College in honor of Colonel Henry Rutgers, a distinguished citizen of New York, a devoted leader of the Reformed Church, and a generous supporter of the college. The college work did not actually begin until after the granting of the second charter in 1770. The exigencies of war at times compelled the removal of the students from New Brunswick. For more than fifty years the college made little progress, and at times its doors were closed. During this period, however, many men were graduated who became greatly distinguished in Church and State. In 1809 a new site, the present campus, was secured, and Queen's Building, for many years the only building, was begun. In 1825, after a period of inactivity, a new era of life and prosperity began, and since that time the doors have never been closed and the work has constantly grown. In 1863 a department, known as the Scientific School, was established, and in 1864 the state of New Jersey declared the Trustees of Rutgers College, maintaining Rutgers Scientific School to be the "State College for the Benefit of Agriculture and the Mechanic Arts," appropriate to the Land Grant Act of the United States, 1862. This has meant a large development of instruction in science and its applications.

The courses of instruction maintained lead to the degrees of B.A., B.L., and B.S. Both Greek and Latin are required in the arts course; Greek is not required in the letters course; neither Greek nor Latin is required in the science course. There are general science courses and technical science courses. In the arts, letters and general science courses, the usual choice of electives is permitted after the freshman year. The requirements for admission to the freshman class are fifteen points for all candidates save those for the technical science courses who are now admitted with fourteen points (after 1914, fifteen points). The teaching staff (1911–1912) numbered fifty-one, and the students' enrollment was 382. Graduate students are not sought for, and special students are received only in occasional instances. Short courses in agriculture are maintained by appropriation of the State with instructors additional to those on the regular staff of the college; there were 126 students in attendance in 1911–1912. The college buildings are distributed on the Queen's Campus, the Neilson Campus, adjoining, and the College Farm, one mile distant. The buildings and grounds and equipment are valued at $1,200,000. The endowment is $700,000. The income for the year 1910–1911 was $215,000.

The presidents have been Jacob Rutsen Hardenbergh, D.D., 1785–1790; William Linn, S.T.D. (*pro tem.*), 1791–1794; Ira Condict, D.D., 1794–1810; John H. Livingston, S.T.D., 1810–1825; Philip Milledoler, S.T.D., 1825–1840; Abraham Bruyn Hasbrouck, LL.D., 1840–1850; Theodore Frelinghuysen, LL.D., 1850–1862; William Henry Campbell, D.D., LL.D., 1863–1881; Merrill Edwards Gates, Ph.D., LL.D., 1882–1890; Austin Scott, Ph.D., LL.D., 1891–1906; William H. S. Demarest, D.D., LL.D., 1906. The governing body is a Board of Trustees of forty-one members. The Governor of the state of New Jersey, the Attorney-General and the Chief Justice of the Supreme Court, are members *ex officio*. The other thirty-eight members are elected by the board itself, five of them on nomination by the Association of Alumni. There is also a Board of Visitors to the Scientific School appointed by the governor.

W. H. S. D.

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RYERSON, EGERTON. — A Canadian educator, was born in the County of Norfolk, Upper Canada (Ontario), in 1803. In 1843, Dr. Ryerson was appointed superintendent of schools for the province with permission to visit the United States and Europe to study at first hand the best systems then in operation. His observations and conclusions were set forth in a lengthy report, and many of the recommendations made in this report were embodied in the Common School Acts of 1846 and 1850. Dr. Ryerson early saw the need of the professional training of teachers, and through his efforts a Provincial Normal School was opened in Toronto. Another measure of Dr. Ryerson's which was productive of great good was the establishment in Toronto of an Educational Depository through which teachers and schools were supplied with textbooks and school apparatus at half price. See Museums, Educational.

During the thirty-three years of his superintendency Dr. Ryerson built broadly and well the foundation of the present system of common school education in Ontario. Through public addresses and conferences and by his numerous writings he sought to develop local interest in education and local activity in support of schools. He devoted much time and thought to the establishment of a system of high schools separated from and yet articulated with the elementary schools. Through his efforts uniform textbooks were adopted, ratebills gradually abolished, and an efficient system of school inspection established. In 1876, Dr. Ryerson resigned his office partly because of some friction between himself and the government of the day, but mainly because of his advanced age He devoted the closing years of his life to literary work, his two best-known works being *A Story of My Life*, and *A History of the United Empire Loyalists*. He died in 1882.

H. T. J. C.

ST. ANDREWS UNIVERSITY. — See Andrews, St., University of.

ST. ANTHONY'S SCHOOL, LONDON. — See Hospital Schools; London Schools.

ST. BEDE'S COLLEGE, PERU, ILL. — See Benedictines, Educational Activity of.

ST. BENEDICT'S COLLEGE, ATCHISON, KAN. — See Benedictines, Educational Activity of.

ST. CYR. — See Military Education.

SAINT-CYR, MAISON DE. — This was one of the earliest schools for girls in France under semistate control, 1686. Some of the educational ideals of the school were unquestionably derived from Fénelon, *De l'éducation des filles* (1687). In 1793 Saint-Cyr was changed into a military hospital. F. E. F.

See Madame de Maintenon.

ST. CYRAN, ABBÉ DE (Jean Baptist du Vergier d'Hauranne). — See Port Royalists.

ST. DAVID'S COLLEGE, LAMPETER, WALES. — An institution founded in 1822 and opened in 1827. While primarily intended to train candidates for the ministry of the Church, especially in Wales, the college also provides courses in classics, mathematics, science, history, and Welsh, leading to the B.A. degree, either a pass or with honors. These courses extend over three years. After a course in divinity the B.D. degree is conferred on candidates who have been at least five years in priest's orders. A two-year course in divinity leading to the Licentiate in Divinity is also offered. The college is affiliated with the universities of Oxford and Cambridge. There is a faculty of nine members, and the enrollment of students in 1910-1911 was 140.

ST. FRANCIS XAVIER COLLEGE, MANHATTAN BOROUGH, N.Y. — See Jesuits, Educational Work of.

ST. GALLEN, ABBEY OF, SWITZERLAND. — An old monastery, which for a time was a prominent center of learning in the Middle Ages. It was founded about 613 by Gallus, an Irishman and friend of St. Columban Under the patronage of Charles Martel and Pepin the early progress of the monastery was assured. About the middle of the seventh century it was attached to the Benedictine order. A school was founded, and great activity was shown in copying Mss. A chant-school was also attached to the monastery in the reign of Charlemagne. The period of its greatest renown as a seat of learning was in the ninth and tenth centuries when the Ekkehards and Notkers (*q.v.*) and many others were connected with it. From letters of Notker Balbulus, who says in one place *Salutant te ellenici fratres* and otherwise uses Greek words, it is inferred that Greek was studied at this time. But interest in learning seems to have declined, and the early humanists in their search for Mss. found at St. Gallen a large collection that had long been neglected. It was here that Poggio discovered a complete copy of Quintilian's (*q.v.*) *Institutio Oratoria.* In 1530 the abbey was reformed, and showed renewed vigor until its suppression in 1798.

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ST. HILDA'S HALL, OXFORD. — See Women, Education of; Beale, Dorothea; Oxford University.

ST. HUGH'S HALL, OXFORD. — See Women, Higher Education of; Oxford University.

ST. JOHN'S COLLEGE, ANNAPOLIS, MD. — Established in 1696 as King William's School, which, in 1785, was merged into St. John's College. Among the students at that early period were George Washington Parke Curtis, step-grandson, and Fairfax and Lawrence Washington, nephews of George Washington. Except for a brief period, during the Civil War, the college has been in constant operation ever since, and has sent out many distinguished sons. In 1907 an affiliation was formed with the professional schools of the University of Maryland, in Baltimore, making St. John's the Department of Arts and Sciences of the University. By this arrangement the academic and professional courses are combined to shorten the usual period demanded for the completion of these courses. The faculty consists of fourteen members directing classical, Latin-scientific, scientific, mechanical, engineering, and civil engineering courses, the first two leading to the degree of B.A. and the last three to that of B.S. Fourteen units are required for admission. A preparatory school is attached to the College and offers the equivalent of the last two years of high school work. The student body numbered 138 in 1911-1912. T. F.

ST. JOSEPH'S COLLEGE, UNIVERSITY OF, MERAMCOOK, N.B. — Founded in 1884 and conducted by the Congregation of the Holy Cross. It was incorporated with power to grant degrees in 1868 and in 1898 a new charter giving the present name was obtained. Commercial and arts courses are offered. A preparatory course of two years is maintained. Graduates of the arts courses (four years) may receive the A.B. and B L. degrees. The preponderating majority of the students are in the preparatory or commercial departments.

ST. LAWRENCE COLLEGE, RAMSGATE. — See Grammar Schools; College, Public Schools.

ST. LAWRENCE UNIVERSITY, CANTON, N.Y. — Was chartered in 1856, under the general auspices of Universalists of the state of New York. From 1868 to 1910 the trustees of the college of letters and science were elected by the New York State convention of Universalists, as are yet the trustees of the theological school. Besides these two schools, a law school and a school of agriculture are maintained. The student attendance in 1911–1912 was 651, of which 235 were in the college of letters and science. The faculty numbers forty-three.

ST. LOUIS. — See Exposition; International Congresses of Education.

ST. LOUIS UNIVERSITY, ST. LOUIS, MO. — Probably the oldest university west of the Mississippi, was founded in 1818 by the Rt. Rev. Louis William Du Bourg, Bishop of Louisiana. In 1827 the institution, then known as St. Louis College, was transferred to the control of the Jesuits. In 1832 the College assumed its present style and received its charter by act of the Missouri Legislature. The university's first professional school, that of divinity, was opened in 1834; medicine followed in 1836, and law in 1843. For some years these schools flourished, but straitened circumstances, caused largely by the unsettled financial and political conditions of the times, led to their discontinuance. The law school was closed in 1847, the medical in 1855, and divinity in 1860. From 1860 until 1889 the university consisted of the College of Liberal Arts with its preparatory schools, and postgraduate courses in literature, philosophy, and science. In 1889 the work of reconstructing the university began by the foundation of the graduate school of philosophy. In 1899 the divinity school was reëstablished; the school of medicine was reopened in 1903; the dental school, the institute of law, and the school of advanced science, in 1908; and the school of commerce and finance, and the department of seismology and meteorology, in 1910.

From its inception the university exercised a direct and far-reaching influence in the colonization and civilization of the middle and far West, and within a few years after the coming of the Jesuits to St. Louis more than forty ecclesiastical and educational foundations were made by professors and alumni of the university. The missionary work of Pierre Jean De Smet, a member of the faculty for nearly fifty years, is famous; the ascendancy which he gained over the Indian tribes was exercised more than once at the request of the government of the United States in preventing outbreaks between the aborigines and the white settlers. Seconding De Smet were Paul Ponziglione and the brothers Adrian and Christian Hoecken, whose missions were centers of civilization from which have sprung many flourishing communities in Kansas, Nebraska, Iowa, and Missouri. Nine of the schools founded by members of the university faculty are now well-established colleges or universities in the West.

In 1912 the teaching staff numbered 252 and the total student body 1381. Of the student body, 497 were enrolled in the college, 83 in divinity (Ph.D. required for admission), 63 in the graduate schools, and the remainder in the various professional and technical schools. Fifteen units are required for admission to the college.

The student body is drawn from thirty-three states and fourteen foreign countries The university is governed by a self-perpetuating board of trustees who are members of the Society of Jesus. Associated with the trustees is an advisory board appointed by the trustees. While the control of the university is thus vested ultimately in the Society of Jesus, it is not the policy of the university to inculcate formal religious teaching in the professional schools. About 60 per cent of the students in these schools profess creeds other than that of the Catholic Church.

The university library contains about 80,000 volumes and a fair collection of medieval and early American manuscripts. The value of the university buildings (eleven in number), grounds, and equipment is about $1,300,000. The president of the university is the Very Rev. Alexander J. Burrowes,

P. L. B.

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ST. LUCIA. — See West Indies, Education in the Smaller Islands of.

ST. MARTIN'S-LE-GRAND SCHOOL, LONDON. — See London Schools.

ST. MARY-LE-BOW CHURCH SCHOOL, LONDON. — See Arches, School of the; London Schools.

ST. MARY'S COLLEGE, ST. MARY'S, KAN. — See Jesus Society of, Educational Work of.

ST. MEINRAD COLLEGE, ST. MEINRAD, IND. — See Benedictines, Educational Activity of.

ST. OLAF'S COLLEGE, NORTHFIELD, MINN. — See Lutheran Church, Educational Activities of.

ST. PAUL'S SCHOOL, LONDON. — See London Schools; also Colet, John; Grammar Schools; Public Schools.

ST. PETER'S SCHOOL, YORK, ENG. — See York School; also Grammar Schools; Public Schools.

ST. PETERSBURG, IMPERIAL UNIVERSITY OF. — See Russia, Education in.

SAINT PIERRE. — See French Colonies, Education in.

ST. THOMAS UNIVERSITY, MANILA. — See Philippine Islands, Education in.

SAINT VINCENT DE PAUL. — See Teaching Orders of the Catholic Church.

ST. VITUS' DANCE. — See Chorea; Hysteria; Tic.

SABBATICAL YEAR IN UNIVERSITY, COLLEGE, AND SCHOOL. — By an ancient law the Israelites were commanded every seventh year (the sabbatical year) to suffer their fields and vineyards to rest or to lie untilled. The term sabbatical year is now widely used among colleges and universities to mean an intermission of labor, first, for rest or pleasure, or, second, for research or study uninterrupted by teaching. The value of granting leaves of absence to teachers in order to freshen and to add new stimulus to their work is heartily conceded by educators. The practice each year is being extended as colleges gain in financial strength, and the provisions under which college teachers are enabled to take such intermission from their work are becoming more and more definitely formulated.

In the public mind, however, especially in states where the pioneer struggle is unforgotten, the idea of the sabbatical year is not readily accepted. It is considered an unjustified luxury, and for this reason the practice is gaining only its first foothold in state and municipal institutions. In this matter tax-supported institutions reflect their sensitiveness to the popular sentiments of their constituencies.

In comparatively few colleges and universities are the privileges of the sabbatical year formulated in the statutes. But in a majority of the institutions the practice is more or less informally in force. The conditions under which the privilege is granted fall under two main heads, — (1) The most usual practice is to grant to professors, assistant professors, or adjunct professors a leave of one year in seven on half salary. The acceptance of such a leave implies, as a rule, that the professor will return to his position after the period of leave; a definite contract to insure such return is seldom asked. Harvard, Columbia, Bryn Mawr, University of Illinois, University of Missouri, and Wellesley are illustrations under this first head in which the privilege is definitely formulated. The practice is also more or less regularly followed at Carleton, Williams, Stanford, Northwestern, Brown, Boston University, Ripon, University of Minnesota, Randolph-Macon, Vassar, and others. At Stanford the professor may accept leave on half pay for a half year in each three and one half years of service, or for an entire year in each seven years; at Columbia the professor has the alternative of one half year in seven on full pay or of one year in seven on half pay. At the University of Wooster one professor in the institution each year is given leave on full pay; at Amherst, Bowdoin, and Miami, not more than two professors may be absent at one time. At Beloit one half year in seven is given on full pay. At Oberlin after ten years of service leave is granted for one year on full pay. At the University of California two thirds of the salary is granted, and the professor may leave on this basis either for one half year after each three years of service, or for one year in each seven years. At Iowa College "part pay" is irregularly granted. (2) A second group of institutions has followed a practice of granting leave by giving to the absent professor the difference between his salary and the amount necessary to employ a substitute. This means that the professor receives from one fourth to one half of his salary while absent. In most cases, the plan has not recommended itself, for it lowers the teaching efficiency of an institution, the substitute being secured at low cost. For this reason the plan was recently discontinued at the University of Georgia. This method is seldom formulated into a statute by colleges; it is merely a custom occasionally in force. Illustrations are Colorado College, Western Reserve, Wells, Rose Polytechnic, Mount Holyoke, Trinity, Tufts.

The granting of leave of absence to teachers in high and elementary schools has not yet been systematized in this country. The most that some teachers can expect is an individual arrangement by which they are granted leave of absence for study without pay but with a definite promise of reëmployment at the end of that term. A beginning has, however, been made at Cambridge, Brookline, Boston, and Newton, Mass., where the sabbatical year has been definitely introduced. At Cambridge a teacher may obtain leave of absence for a year after ten years of service, receiving one third of his or her annual salary, the leave being spent in study or travel. At Boston applicants for leave of absence must state the purpose for which they desire the leave. One year after seven years of service is granted on half pay for purposes of study or travel; while for purposes of rest one year after twenty years of service may be obtained. Teachers who receive leave of absence are bound by contract to serve in Boston for three years after their return. The conditions at

Newton are similar to those in Boston. In 1908 Rochester, N.Y., adopted a plan similar to that of Boston.

England. — The sabbatical term is unknown in the English universities and higher institutions of learning and in elementary schools. A few private secondary schools for boys and girls have arranged to grant short periods of absences, ranging from three to six months, on half or full pay, but these instances are not sufficient to warrant any statement as to the further adoption of the system.

SACROBOSCO, JOANNES DE (HOLYWOOD or HALIFAX) (fl. 1230). — An early English mathematician born at Holywood (now Halifax), in Yorkshire, Sacrobosco being the Latinized form of Holywood. Sacrobosco studied at Oxford and taught astronomy and mathematics at Paris. His astronomical work, *De sphæra mundi*, was popular for three centuries. The arithmetical work, *Tractatus de arte numerandi*, is a collection of rules without proofs or examples. It is the first work of the kind in the new numerals written by an Englishman. In it are given eleven chapters on the distinct operations in arithmetic: *numeratio, additio, subtractio, mediatio, duplatio, multiplicatio, divisio, progressio, perambulum ad radicum extractionem*, and *extractio radicum in cubicis.* Two other works are also known to have been written by Sacrobosco: *De computo ecclesiastico*, or *De anni ratione*, and *De Astrolabio.*

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SACRED HEART COLLEGE, PRAIRIE DU CHIEN, WIS. — See JESUITS, EDUCATIONAL WORK OF.

SADOLETO, JACOPO (1477–1547). — See RENAISSANCE AND EDUCATION.

SAGE, RUSSELL, FOUNDATION. — An organization incorporated in 1907 for the "improvement of social and living conditions in the United States of America" by such means as the trustees think fit without encroaching on work that is already done effectively by any other body. The Foundation, which is in the control of a body of nine trustees, was established by Mrs. Russell Sage, who gave an endowment of $10,000,000. It is not the intention of the Foundation to relieve individual or family needs, but to eradicate poverty by an investigation of its causes. No aid is given to churches of any denomination. The work of the Foundation is distributed among several departments which conduct propagandist and research work. The following is an enumeration of some of the directions of the activities and studies of the Foundation: Campaigns against tuberculosis; the prevention of blindness, especially among children; the provision of public recreation; medical inspection of schools; school gardens; the care of children in institutions; charity organization; workingmen's and other kinds of small insurances; the Pittsburgh Survey, a study of the social and economic conditions in a large city; housing problems in large cities; the question of backward children, retardation and elimination; open-air schools; wider use of the school plant; provision of meals in schools. This Foundation has also assisted towards the establishment of departments for the training of social investigators in schools of philanthropy in Boston, New York, Chicago, and St. Louis. Generally, the educational studies and research of the Foundation are directed to establishing methods of measuring educational results. John M. Glenn is the secretary and general director of the Foundation, which has its offices in New York.

See RESEARCH, ENDOWMENT OF.

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SAILER, JOHANN MICHAEL (1751–1832). — One of the most prominent Catholic German educators, was born as the son of a shoemaker at Aresing, near Augsburg, in Bavaria, studied at the gymnasium in Munich, and, in 1770, entered the Jesuit College at Landsberg as a novice. When the order was abolished, in 1773, he went to the University of Ingolstadt, where he devoted himself to theology, philosophy, and mathematics. In 1775 he was consecrated as a priest, and in 1780 he received the appointment as professor of dogmatic theology at Ingolstadt. Later on (1784) he was made professor of pastoral theology, ethics, and dogmatics at the episcopal seminary at Dillingen. In consequence of his tolerant religious views, which brought him in contact with many Protestant scholars, he made some powerful enemies who succeeded in having him removed from his position in 1794. In 1799, however, he was again called to the University of Ingolstadt. The following year the university was removed to Landshut, and Sailer remained there for twenty years as professor of morals and practical theology. He lectured also on pedagogy and wrote his chief work, *Über Erziehung für Erzieher* (*On Education, for Educators*), which appeared in 1807, being enthusiastically hailed by Diesterweg (*q.v.*). In 1829 he was made Bishop of Regensburg; in this position he died in 1832, leaving behind him the fame not only of a great thinker and educator but of a man of peculiar sweetness and nobility of character. His complete works, in forty volumes, were published by Widener, Sulzbach, 1830–1842. F. M.

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Rein, W. *Encyklopädisches Handbuch der Pädagogik*, s.v. *Sailer, Johann Michael.*

SALAMANCA, UNIVERSITY OF, SPAIN. — One of the most famous and influential of medieval universities. The chapter school which had previously existed was given the status of a university by Alfonso IX before 1230, but did not meet with success. It was refounded by Ferdinand III of Castile and received a charter of privileges in 1242. Progress was not made, however, until the reign of Alfonso X, the Wise, who gave the university a new charter in 1254. A Bull confirming the university was granted in 1255. Salamanca in its constitution (the *Siete Partidas* was issued in 1263 for all Spanish universities) was based largely on the Bologna organization, with the exception that the historical connection with the Cathedral and hence with the Bishops and *Magister Scholarum* was retained to some extent. Alfonso X gave an endowment and encouraged the study of both branches of law, a field for which the university gained great repute in the fourteenth century, doctors of law ranking as a superior social class. At the same period a degree and practical instruction in music were given, and a master of music was included among the teaching body. Under Ferdinand IV and Pope Boniface VIII the university was endowed with the *tertia ecclesiarum*, an arrangement which led to difficulties with the Cathedral and the suspension of the university activities from 1310 to 1313. In 1380 chairs were established in theology on the recommendation of the Papal Legate, who as Benedict XIII showed much favor to the university and granted new statutes in 1411 in which student government was largely recognized, subject to the authority in certain directions of the Chancellor, formerly the *Scholasticus* or *Magister Scholarum.* In the fourteenth and fifteenth centuries the university was noted for its theological studies and was regarded in opposition to Paris as the center of orthodoxy. At the same time its breadth of view and independence are illustrated by the lectures on the Copernican system and the encouragement given to Columbus. About this period a number of colleges were established. The University of Salamanca reached the height of its fame and success in the sixteenth century, when it was attended by nearly 7000 students. A decline set in, however, and became more and more rapid; studies were neglected; empty disputations flourished; and the number of students dwindled. An attempt to resuscitate the ancient glories was made in 1769–1777, but these efforts were nullified by the political disturbances at the beginning of the new century. The present organization goes back to the law of Sept. 3, 1857, passed under Isabella II. There are now the following faculties: philosophy and letters, law, sciences, and medicine. The enrollment in 1911 was about 1200.

See Spain, Education in.

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SALARIES OF COLLEGE PROFESSORS. — See College Professors, Salaries of.

SALERNO, UNIVERSITY OF. — See Universities.

SALINE LAND GRANTS. — See National Government and Education; School Funds, Permanent.

SALISBURY, ALBERT (1843–1911). — Normal school principal; graduated at Milton College, Wisconsin. He was conductor of teachers' institutes in Wisconsin; superintendent of the American Missionary Association, and principal of the state normal school at Whitewater, Wis., from 1885 to 1911. His publications include *Phonology and Orthoepy, History of Normal Instruction in Wisconsin, Duty of the State to the Feeble-Minded, The Rural School Problem*, and *Theory of Teaching and Elementary Psychology.* W. S. M.

SALISBURY, JOHN OF. — See John of Salisbury.

SALLUST. — C. Sallustius Crispus, politician, Cæsarian partisan, and historian (86–34 B.C.), was regarded by Roman critics as the Thucydides of Rome. Compared with his great Greek model, he is, however, distinctly inferior, but owing to his use of original sources, his critical and philosophical judgment, he well deserves to be regarded as the father of Latin scientific history. Though obscured for a time by the greater brilliancy of his later contemporary, Livy, he regained his ascendancy in the Silver Age, and left a strong impress upon Seneca and Tacitus.

His *Historiæ*, in five books, have perished, but we still have two extensive monographs, the story of the conspiracy of Catiline (*bellum Catilinæ*) and of the war against Jugurtha (*bellum Jugurthinum*). Of these the former occupied at one time an important place in the secondary Latin curriculum and even now, when time allows, is often read, in conjunction with the Catilinarian speeches of Cicero, upon which it furnishes a valuable commentary, showing, though grudgingly, for Sallust was a political opponent of Cicero, the gravity of the crisis, and the great value of Cicero's services to the state at this juncture.

In reading the *Catilina* in the schools, the philosophic introduction, amounting to about one fourth of the whole, may well be omitted or deferred. This is a masterly analysis of the causes of the degeneracy of Roman morals at this time, but it requires considerable maturity of mind on the part of the students. Particular attention should, however, be devoted to the speeches of Cato and Cæsar, both as examples of a different type of oratory, and as indicating the political conditions which were to lead naturally in a few years to the dictatorship of Cæsar.

The style of Sallust, while Ciceronian, is characterized by archaizing colloquialisms and rhetorical devices, for which may be consulted Constans, *de sermone Sallustiano* (Paris, 1880), and Uri, *Quatenus apud S. sermonis plebeii vestigia appareant* (Paris, 1885).

The most important critical editions are by Dietsch (Leipzig, 1864, with index) and Jordan (Berlin, 1887). The most available editions of the *Catilina* and *Iugurtha* are by Long (revised by Fraser, London, 1890), and Capes (Oxford, 1889). There are numerous school editions of the *Catilina*. G. L.

SALOMON, OTTO. — See Manual Training; Sloyd.

SALVANDY, NARCISSE ACHILLE, COMTE DE (1795–1856). — French historian, statesman, and educator. He was a member of the chamber of deputies throughout nearly the whole existence of the July monarchy (1830–1848), being twice minister of public instruction (1837–1839; 1845–1848), and twice absent in the diplomatic service (Madrid, 1841–1843; Turin, 1843–1845). He was elected member of the French Academy in 1835. The most important work of his career was his occupancy of the portfolio of public instruction. He organized the education department; the university was practically refounded; the inspection of primary schools was strengthened by the appointment of subinspectors and the fixing of the salary scale; the *salles d'asile* were reorganized so as to make them educational rather than mere charitable institutions (1837); and a bill for the fundamental reorganization of the whole primary school scheme submitted during his second term as minister was brought to an untimely end by the revolution of 1848. This likewise saw the close of his political career. He was the author of: *La Coalition et la France* (1816); *Histoire de Pologne avant et sous le Roi Jean Sobieski* (3 vols., 1827–1829); *Seize mois, ou la Révolution de 1830 et les Révolutionnaires* (1831). F. E. F.

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SALZMANN, CHRISTIAN GOTTHILF (1744–1811). — A prominent German educator of the Philanthropinist school, was born as the son of a Protestant pastor at Sömmerda, near Erfurt, Thüringen. He received his first education from his father and then attended for two years the gymnasium in Langensalza. From 1761 to 1764 he studied theology in Jena; in 1768 he became pastor in a little village near Erfurt, and later in Erfurt itself. From there he was called as preacher to the Dessau Philanthropinum, where for three years he directed the devotional exercises and gave religious instruction. In 1784 he founded the educational institution of Schnepfenthal, near Gotha, the only one of the Philanthropinist institutions which has existed to our times. This school he directed until his death. Among his first teachers was Guts Muths (*q.v.*), the founder of the German system of gymnastic instruction; one of his first pupils was Karl Ritter (*q.v.*), the famous geographer. Salzmann's educational ideas were based on those of Basedow (*q.v.*), but he was saner, less sensational, and more practical than Basedow, and for this reason his direct results were more lasting. His school emphasized physical education, manual training, nature study, observation of familiar objects, and incitement of the pupils to self-activity. In the teaching of the foreign languages, he discarded the old grammatical method and relied on speaking the language and on careful and extended reading. The ambition of the pupils was stimulated by an elaborate system of rewards, and the chief aim of the school was to reproduce as much as possible the conditions of a happy and busy family life in order to educate its pupils to become, as Salzmann says, "healthy, rational, good, and cheerful human beings."

Among the many writings of Salzmann, most of which aim to convey his thoughts on education under the form of fiction, two are especially noteworthy, his *Krebsbüchlein* (*Little Crab Book*), 1780, and *Ameisenbüchlein* (*Little Ant Book*), 1806, both of which were very widely read and frequently reprinted. The former is a biting satire on the prevalent home education of his time; its subtitle is *Direction towards an Irrational Education of Children.* The plan of the book may be sufficiently indicated by the titles of some of the chapters, as *How to teach children to lie, How to make them stupid, vain,* etc. The *Ameisenbüchlein* contains Salzmann's maturest thoughts on education; it calls upon the educator to educate himself. In it he proclaims as a "confession of faith" for a teacher the maxim that "the causes of all the faults and vices of his pupils an educator must try to find in himself." F. M.

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SAN SALVADOR, EDUCATION IN THE REPUBLIC OF. — San Salvador was freed from Spanish rule in 1821, and until 1847 formed a division in the Central American Federation, becoming an independent republic upon the dissolution of this union. The constitution adopted in 1824 under the Federation has been slightly modified by amendments, the last in 1886. The area of the republic is 7225 square miles and its population 1,070,000 (census 1910). For administrative purposes the country is divided into fourteen departments which are independent in respect to educational matters, subject, however, to the general law under which public primary education is declared free, obligatory, and secular. The government maintains a system of primary schools to serve as models for those supported by the departments and by cities.

The chief educational authority is the minister of public instruction, who is assisted by a council of public instruction, elected by the members of the university faculty.

At the present time there is much activity in respect to the development of the internal resources of the country, the construction of railroads, and the establishment of telegraphic and telephonic communication.

In his annual message at the opening of the Congress of the Republic, February, 1912, President Araujo submitted the following particulars as to the public schools: The number of primary schools in the Republic in the scholastic year 1911 was 486, — 203 for boys, 200 for girls, and 83 mixed. Teachers to the number of 851 found employment in these schools; of these there were 382 men and 469 women. The number of pupils enrolled was 21,569, of whom 11,633 were girls and 9936 boys. The total population of the Republic of school age was 173,595 females and 82,541 males. The government expenditure for public schools amounted to $293,693.

During the session of 1912 the Congress of Salvador passed a law subventioning to the amount of 200 pesos per month the "Colegio Moderno" (Modern College) of Santa Ana, and arranged for the establishment of colleges for girls at Ilobasco and Sonsonate and for the founding of elementary industrial schools in the cities of San Salvador, Santa Ana, and San Miguel.

At the capital, San Salvador, there is a university with faculties of jurisprudence, medicine, natural sciences, and engineering, and also a national library. A. T. S.

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SANBORN, EDWARD DAVID (1808–1885). — College professor; graduated from Dartmouth College in 1832 and subsequently studied at the Andover Theological Seminary. He was engaged in secondary school work in New Hampshire; was professor at Dartmouth College from 1835 to 1859 and again from 1864 to 1882, and at Washington University, St. Louis, from 1859 to 1864. He was active in the New Hampshire State Teachers' Association. His educational publications include *Lectures on Education*, and articles in journals and reviews. W. S. M.

SANCTIS, FRANCESCO DE. — See Literature, Comparative.

SAND MODELING AND SAND TABLES. — See Modeling.

SANITARIUM SCHOOLS. — See Outdoor Schools.

SANITARY LATRINES AND OUTHOUSES. — See Latrines.

SANITARY SCIENCE, TEACHING OF. — See Hygiene, Teaching of.

SANITATION, SCHOOL. — See Architecture, School; Disinfectants; Hygiene, School.

SANSKRIT LANGUAGE AND LITERATURE. — See Oriental Languages and Literature.

SANTIAGO DE CHILE, UNIVERSITY OF. — See Chile, Education in.

SANTIAGO, UNIVERSITY OF, SPAIN. — See Spain, Education in.

SANTO DOMINGO, EDUCATION IN. — The Republic of Santo Domingo occupies the eastern portion of the island of the same name, covering an area of about 18,000 square miles and having an estimated population of 700,000.

The political vicissitudes of the country since its separation from Haiti in 1844, the mixture of races, and the tropical climate have all combined to prevent any marked progress in education. A decided impulse was given to this cause in 1884 under the lead of President Billini, primary instruction was declared free and obligatory, and the outlines of a system were issued by the minister of public instruction. French models were followed in this plan, the schools being classified as primary, higher primary, normal, lycées and colleges, preparing students for the bachelor's degree, schools for girls, schools of arts and trades, universities, and higher professional and technical schools. This ambitious scheme has been very imperfectly realized; but examples of nearly every class of schools named are found in the republic.

The establishment of primary schools is left to the communes with the aid of government grants; but little interest is shown in respect to popular education outside of the few cities. Official reports for 1910 give a total of 526 primary schools, parochial and communal, with 18,810 pupils, equivalent to 2 per cent of the population.

The latest developments in education have reference to the agricultural interests of the republic: At Cienega a government school for the cultivation of tobacco has been established, and an agricultural school was opened at San Cristobal in April, 1911.

The most successful schools for girls are maintained by the teaching sisterhoods of the Catholic Church, while the similar schools for boys in charge of the religious orders have paid much attention to the manual arts.

A. T. S.

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SAPIDUS, JOHANNES (1490–1561). — The Latinized name of Hans Witz, a nephew of Wimpheling and a German humanist. He was born at Schlettstadt, then a center of humanistic studies, and after attending the gymnasium there, he studied in Paris. He later became rector of the gymnasium of his native town and soon had one of the most flourishing schools in the country. It is thought that he introduced Greek into the school. Thomas Platter (*q.v.*), who was a pupil at Schlettstadt for a time, says that in his day there were 900 pupils in attendance, "some of them well-bred, learned scholars." Owing to his sympathies with the Reformation movement, Sapidus was compelled to leave Schlettstadt, which remained Catholic. In 1538 he became a teacher at the gymnasium at Strassburg under Sturm, who became his son-in-law, and there remained until his death. A play written by Sapidus, *Lazarus Redivivus, Comœdia Nova et Sacra*, was performed on the removal of the school into new buildings in 1539.

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SARACEN EDUCATION. — See Arabic Education; Mohammedan Education.

SARAGOSSA, UNIVERSITY OF, SPAIN. — See Spain, Education in.

SARATOV, IMPERIAL NICHOLAS UNIVERSITY. — See Russia, Education in.

SARAVIA, ADRIAN À (1531–1613). — Schoolmaster and divine, who affords a typical instance of the influence of religious refugees on the history of English education. Born in 1531, at Hesdin in Artois, his father was Spanish, his mother Flemish, and both of them became Protestants. Adrian was trained for the university, and entered that of Antwerp. In 1560 Saravia withdrew to the Channel Islands, on account of religious troubles in the Low Countries. After studying at Oxford in 1561, he returned to the Channel Islands in 1563 and became head master of Elizabeth College, Guernsey. In 1576 he had become head master of Southampton Grammar School, and there remain entries in the town records of payments to him for the expenses of his boys' theatrical performances. He was also a prominent member of the French refugees' Church of Domus Dei at Southampton.

Amongst his pupils were Joshua Sylvester (translator from the French of the *Divine Weeks and Workes* of Du Bartas), from 1573 to 1576; Robert Ashley, the translator from the French of Louis Leroy (Ludovicus Regius), and Sir Thomas Lake, who became Latin Secretary to King James I. Saravia's Southampton School probably ranks as the first grammar school in England in which French was systematically taught. Ashley says "It was a rule all should speak French: he who spoke English, though only a sentence, was obliged to wear a fool's cap at meals, and to continue to wear it till he caught another in the same fault." Saravia had left England by 1582 for a professorship of divinity at Leyden, but returned to England and was successively prebendary of Gloucester, of Canterbury, and, in 1601, of Westminster. In 1607–1611 he was one of the translators of the English Bible, on the committee of three to translate Genesis to II Kings.

F. W.

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SARDINIA, EDUCATION IN. — See Italy, Education in.

SARMIENTO, DOMINGO FAUSTINO (1811–1888). — South American educator and statesman; was largely self-educated. He began his career as a teacher in Argentina; and in 1836 he established a school for girls which he directed until 1842, when he organized the first South American normal school. He went to Europe in 1845 to study educational conditions. Here he found a copy of Horace Mann's *Seventh Report* to the State Board of Education. This brought him to America, where he spent some months in Massachusetts with Horace Mann (*q.v.*) and in Connecticut with Henry Barnard (*q.v.*). He attended many educational associations and teachers' institutes and visited a large number of schools. The results of this visit were embodied in a book (in Spanish), *Schools the Basis of Prosperity in a Republic.* He returned to Argentina and engaged in educational work. In 1857 he became minister of public instruction. He was sent to the United States as minister from Argentina in 1865, and three years later he was elected president of the Republic of Argentina. His educational publications include *De la Educación Popular* (1848), *Memoria sobre Instrucción Primaria* (1849), *Las Escuelas base de la Prosperidad en los Estados Unidos* (1868), and a life of Abraham Lincoln. He also translated into Spanish considerable portions of Barnard's *American Journal of Education.* Sarmiento is generally called " the Horace Mann of South America."

W. S. M.

See Argentine Republic, Education in.

Reference: —

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SASKATCHEWAN, EDUCATION IN. — See Canada, Education in.

SASKATCHEWAN, UNIVERSITY OF, SASKATOON, CANADA. — An institution established by a Provincial Act of 1907. Classes in arts and science were opened in temporary buildings in 1909. A college of agriculture has also been added, and the educational work formerly conducted by the Department of Agriculture has been transferred to the university. The university site, consisting of 1333 acres, is located along the Saskatchewan River. The government of the university is in the hands of the chancellor and a senate of twelve members elected by convocation, which consists of registered graduates of British universities residing in the province and a number of *ex officio* members. The business affairs of the university are managed by a board of governors, partly elected by the senate and partly appointed by the governor-in-council. Courses in the college of arts and science are open to students who have passed the junior matriculation or its equivalent. Students are admitted to the college of agriculture who have received a public school training and have done two years' work on a farm. The following degrees are conferred by the university: B.A., M.A., B.Sc., and M.Sc., B.Sc. Agr., B.Sc. Eng., B.Sc., Educ., LL.B., M.D., M.Ch., and D.D.S. The first commencement was held in 1912. The enrollment of students in 1911–1912 was 160, and the faculty consisted of twenty-two members.

SASSARI, ROYAL UNIVERSITY OF. — See Italy, Education in.

SATYRIASIS. — See Nymphomania; Sexual Anomalies.

SAVAGE EDUCATION. — See Primitive Society, Education in.

SAVILE, SIR HENRY (1549–1622). — " The most learned Englishman in profane literature of the reign of Elizabeth," born near Halifax, England, and educated at and elected Fellow of Merton College, 1565. In 1578 he traveled abroad and collected manuscripts. He was tutor in Greek to Queen Elizabeth and in 1585 became Warden of Merton. In 1595 he was nominated as Secretary of the Latin tongue, but in 1596 he became Provost of Eton College and also continued to hold the Wardenship of Merton College. He was one of the translators of the Bible into English (1607–1611). At Eton, Savile, who was a strong administrator, reorganized the library. His greatest literary work, the most exacting in Greek scholarship achieved by an Englishman in Queen Elizabeth's reign, was the preparation of the magnificent edition of St. Chrysostom's (*q.v.*) works, for which he sent agents to almost every part of Europe to make collections of texts, and gathered round him at Eton some of the best English Greek scholars, *e.g.* Richard Montagu, Hales, Boys, Carleton, and Allen. Savile also wrote a translation with notes of four books of the *Histories of Tacitus,* 1591, and archæological books on *Military Matters amongst the Romans,* first published in the *Tacitus* and afterwards separately in 1601. He wrote an account of the *Wages paid Ancient Roman Soldiers* (1595). In 1621 was issued *Prælectiones tresdecim in principium elementorum Euclidis.* Educationally, Savile's services to mathematics are no less marked than his erudition in Greek. He established in 1619 two lectureships, now professorships, at Oxford, each of £150 a year, in the subjects of geometry and astronomy, founded a mathematical library, and a mathematical chest, and gave £100 to provide apparatus. He delivered the first lectures in geometry himself in 1621. The professor of geometry was also to expound arithmetic of all kinds, speculative and practical; land surveying; canonics or music, and mechanics. The professor of astronomy similarly was to lecture on optics, gnomonics, geography, and the rules of navigation. But both professors were to be accessible for consultation by students, both to give attention to practical, or as we should say, laboratory methods, and both were made responsible for the equipment and safe-keeping of mathematical books, "instruments and tables and other furniture." Savile is thus for Greek literature and mathematical science the most outstanding figure of Queen Elizabeth's reign. F. W.

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SAVINGS BANKS, SCHOOL. — Though the school savings bank has been in existence for a long time, the plan has not as yet made the headway in this country which its importance deserves. In France, Belgium, England, Scotland, and parts of Germany, the school savings bank is a well-established and an important educational institution, while in Switzerland, Austria, and Italy, many such banks are found.

The first school savings bank seems to have been organized at Goslar, near the Harz Mountains, in 1820, and another at Apolda, in Thuringia, in 1833. Both of these are small German mining towns. The idea was introduced into France in 1834, and grew rapidly thereafter, though the great French development has been since the establishment of the third republic. Between 1874 and 1886, France established 24,000 school savings banks, with nearly half a million of deposits, and to-day the school savings bank is found generally throughout France. In 1866 the idea was introduced into Belgium, and still later into England, Switzerland, Italy, and other countries. In some of the German states and provinces, as for example, Saxony, Silesia, Posen, and the duchies of Meiningen and Brunswick, every little village and town is said to have its school savings bank. The school savings bank has also found a firm footing in Belgium.

In the United States, public attention was attracted to the idea in 1876, but the first practical introduction of the idea was not until 1885. In that year Mr. J. H. Thiry instituted a savings system, adapted from plans followed in Europe, into the public schools of Long Island City, New York, and began to interest school officials in the idea. Rutland, Vt., and Islip, L.I., began school savings banks in 1886; Amsterdam, N.Y., in 1887; Jamestown, N.Y., in 1888; and Pottstown, Pa., Brooklyn, Olean, and Kingston, N.Y., in 1889. Eight cities in Pennsylvania, one in Massachusetts, one in New York, and one in Ohio were added in 1890, and each year since then has seen an addition to the number of cities adopting the idea. Pennsylvania, New Jersey, and Michigan have been prominent in the work, as have also, to a lesser degree, Massachusetts, Connecticut, and Maryland. On the other hand, little or nothing has as yet been done in establishing school savings banks in many of our states. Recently Porto Rico has done important work in organizing school banks, as has also the Philippines. On January 1, 1910, school savings banks existed in 108 cities in the United States. Deposits were collected at 7330 school houses or stations, and the depositors numbered 166,525. In the twenty-five years since the first bank was established in the United States, the total deposits have amounted to $4,618,734.96, the withdrawals to $3,893,637.47, leaving a balance in the banks of $725,097.49.

Many different plans are followed in different places and countries, though in a way nearly all of these reduce themselves to two. The essential feature of each of these is that the classroom teacher in the different schools collects or receives such small sums as the pupils of her class wish to put into the school savings bank. Either the teachers give the pupil credit on a blank form provided for that purpose and deliver the money collected to a bank, directly or indirectly, or they give the pupils stamps in exchange for the money turned over to them, and these stamps can be taken to a bank and exchanged for a bank book and deposit, or for cash. The two plans may be illustrated by the practice of two Michigan cities. Adrian uses the Thiry, or deposit system. The children bring their money to the school every Monday morning and give it to their class teachers. Each pupil has his or her own bank book, which is in the form of a card folder. The teacher then makes out, on a blank form, a list of depositors and the amount deposited by each. This is placed with the money in a sealed envelope, and sent first to the Superintendent of Schools, and thence to the bank. Usually under the Thiry system the bank merely records the total amount, not opening individual accounts until a child has at least three dollars on deposit, but in Adrian accounts are opened regardless of amount. In some cities the bank sends a collector to each school, on deposit days, to receive the money. Deposits of one dollar and upward draw interest, compounded semiannually. To withdraw money requires the presence of the pupil and a parent, and the signature of a school officer. During the summer vacation the bank deals directly with the pupils.

Grand Rapids illustrates the stamp system. Stamps are furnished to the teachers by a city savings bank, and these the pupils purchase.

Each pupil becoming a depositor is given a folder, with spaces for fifty stamps to be pasted on. When the folder is filled the pupil may exchange it for cash at the bank, or deposit it and receive a bank book, showing a deposit of fifty cents. The same plan for withdrawal rules as under the other system.

Some object to both the deposit and the stamp systems, as consuming too much time, and a system involving a less expenditure of effort has been evolved by Superintendent Reiman, at Hudson, Mich., which has become known locally as the Reiman system. In this each child has a card, three by six inches in size, ruled for forty weeks. When the child brings money, the teacher enters the amount and the balance on the card. The money turned in by the class as a whole is put in an envelope and sent to the principal, the bank calling for it at his office once each week. The principal and the bank do not deal with individual accounts until a child has one dollar on his card. When this occurs this amount is subtracted from the balance and transferred to the bank account, and this happens as often as a dollar is deposited. Otherwise the system is much like the others. The advantages claimed for the Reiman system are the ease and economy in handling the accounts.

The fundamental idea underlying the plan is the encouragement of thrift among the children in the schools, and it has received the hearty coöperation of bankers generally. The business, as banking business, does not pay at all, but the influence in developing habits of thrift and economy is so valuable that banks are usually willing to do the business at a loss. Some banks have provided special low windows for pupils' use, and the experience of many cities has been that pupils frequently transfer their accounts from the school savings bank to the regular savings banks, and thus early begin to learn to look upon economy, thrift, and a savings bank account as desirable things to possess. E. P. C.

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Many magazine articles and pamphlets have appeared on this subject. Among the more important are the following: —

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Report of U. S. Com. of Ed. 1888–1889, Vol. I, pp. 655–669. (Gives details of organization; consists of extracts from above.)

U. S. Bur. Educ. *Rep. Com. Ed.*, 1896–1897, pp. 160–164. School Savings Banks. (Europe and America.)

SAXE-ALTENBURG, DUCHY OF, EDUCATION IN. — See German Empire, Education in.

SAXE-COBURG-GOTHA, DUCHY OF, EDUCATION IN. — See German Empire, Education in.

SAXE-MEININGEN, DUCHY OF, EDUCATION IN. — See German Empire, Education in.

SAXE-WEIMAR, GRAND-DUCHY OF, EDUCATION IN. — See German Empire, Education in.

SAXON SCHOOLS. — See Anglo-Saxon Schools.

SAXONY, KINGDOM OF, EDUCATION IN. — See German Empire, Education in.

SAY, JEAN BAPTISTE (1767–1832). — French economist, journalist, and teacher. Napoleon appointed him on the Committee on Finance in 1799. His *Traité d'Économie politique* (1803) was the cause of his retirement from the state service, but he was later appointed professor of political economy at the Conservatoire des Arts et Métiers (1821), and professor of the same subject at the Collège de France (1830). His most important work of an educational character was *Olbie, ou Essai sur les Moyens de réformer les Mœurs d'une Nation* (Paris, an VIII), decidedly Utopian in its general conception. While this is in no wise a treatise on education, he assumes an acquaintance with the principles of education "discussed and established by the great masters, at the head of whom among the modern writers one reckons Montaigne, Locke, and Rousseau." He also wrote *Cours complet d'Économie politique pratique* (6 vols. in 3, Paris, 1828–1829). F. E. F.

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Du Puynode, M. G. Partounau. *Études sur les principaux Economistes*, pp. 336–410. (Paris, 1868.)

Michel, G. *Léon Say.* (Paris, 1899.)

SAY, THOMAS (1787–1834). — Scientist and founder of the Academy of Natural Science at Philadelphia; was self-educated. He was teacher of science in the schools organized by Robert Owen and William Maclure (*qq.v.*) in connection with the social community at New Harmony, Ind. He was connected with various scientific expeditions, and was the author of many scientific publications.

W. S. M.

Reference: —

Monroe, Will S. *History of the Pestalozzian Movement in the United States.* (Syracuse, 1907.)

SCALE. — See Musical Notation.

SCALES OF NOTATION. — See Counting.

SCALIGER, JOSEPH JUSTUS (1540–1609). — One of the foremost classical scholars of his age, born at Agen, near Bordeaux, where he attended the Collège de Guienne (1552–1555). After leaving school he acted as amanuensis to his father, Julius Cæsar Scaliger (1484–1559), himself no mean scholar, and acquired considerable facility in Latin. After his father's death he attended the University of Paris for four years and studied Greek mainly and also Arabic and Hebrew. For a time he traveled widely with Louis de Chastaigner, a French nobleman with whose household he was connected for thirty years. In 1570 he studied law at Valence under Cujas. During his travels Scaliger had become a Protestant, and after the massacre of St. Bartholomew's fled to Geneva, where he was appointed professor at the Academy, a position which he soon resigned, owing to his dislike for lecturing. In 1574 he was again in Paris, and his literary activity now began. He issued editions of classical works which were marked by sound textual criticism, based on a careful study of Mss.; these included the *Catalecta* of Vergil (1575); Festus (1575); Catullus, Tibullus, and Propertius (1577). In 1579 he edited Manilius, an ancient astronomer, and in 1583 published *De Emendatione Temporum*, a reconstruction of the hitherto accepted chronology, supplemented in 1606 by the *Thesaurus Temporum*, a collection of the chronological works in Greek and Latin, which included his edition and reconstruction of the *Chronicles* of Eusebius. Scaliger's reputation was established as the foremost scholar and textual and historical critic of his day. In 1593 he accepted a professorship at the University of Leyden which involved no lecturing. Scaliger's last years were embittered by the attacks of the Jesuits, on whose behalf Scioppius wrote *Scaliger Hypobolimæus* (1607) to disprove Scaliger's claim, put forward in his *Epistola de Vetustate et Splendore Gentis Scaligeræ et J. C. Scaligeri Vita* (1594), to be descended from the La Scala family of Verona. Scaliger replied in the *Confutatio fabulæ Burdonum*, which convinced only his friends.

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SCARLET FEVER, OR SCARLATINA, is an infectious disease of very contagious character. The specific cause is not positively known. It is supposed by many to be a microbe morphologically similar to the streptococcus. The symptoms are sudden fever, vomiting, redness of the tonsils, sore throat, flushed skin, and from twelve to thirty-six hours after the first symptoms a fine scarlet rash, especially on the chest and neck, and at a later period peeling of the skin and frequently discharge from the nose or ears. The period of incubation varies from twelve hours to three weeks, but in most cases it is from four to seven days. The maximum morbidity and mortality occurs in the early years of life, most of the cases occurring before the age of fourteen. During the early years it is a very serious disease, and the more so because of serious complications and sequelæ that are liable to occur. The mortality is especially large before the age of six. The incidence of the disease according to age is well illustrated by the investigations made by Dr. Meder at Brünn for a period of fifteen years. The results are shown in the following table based on 5225 cases.

MORBIDITY AND MORTALITY FROM SCARLET FEVER ACCORDING TO AGE

Years	0–1	1–3	3–6	6–14	14–20	20–30	30–40	40–50	50–60	60–
Cases	123	995	1851	1891	239	90	26	7	3	—
Deaths	42	258	305	131	12	4	4	1	—	—

Scarlet fever is spread by contact with another person infected or a carrier of the germs of the disease; but contrary to popular opinion the peeling of the skin seems to have little to do with the infectivity, and the possibility of the disease being carried in clothing or the like is doubtful. Investigations in the London schools indicate that the disease may be spread in classrooms through personal contact with a previously known case, a mild, unrecognized case not excluded from school, or rarely a healthy carrier case. The chief sources of infection in the school are probably cases that have not been recognized, either those in the early stages or the so-called missed cases. The period of possible infection seems to be a long one, from four to eight weeks or even more. There are very great individual differences in the susceptibility to scarlet fever. Certain individuals and families, and perhaps certain races, seem to be largely immune to the disease.

A much smaller number of cases is likely to occur during the vacation months of the summer. (See Contagious Diseases.) This may be due to the season of the year more than to the fact that the school is a factor in spreading the disease. The London studies indicate that the school influence in the spread of the disease is usually small. Even where children return to school before the peeling of the skin is complete, secondary cases seldom occur.

It is customary to exclude children who have this disease from school for a period of from four to eight weeks, and in any case they should not be readmitted until after the sore throat and scaling of the skin have disappeared; and it is deemed necessary that other members of the family where a case occurs should also be excluded from the school.

In regard to school closure for scarlet fever opinion is divided, and the question should be decided in any case with regard to local conditions. In a community where there is no medical inspection it seems wise to close the school at the first indication of the presence of the disease, and parents should be notified to take special care of their children. In a community where there is competent health inspection, school nurses as well as school physicians, it seems to be unnecessary and unwise to close the school on account of the disease; but class closure may be desirable in kindergartens and primary grades.

Various serums for scarlet fever have been prepared, but at present there seems to be no specific remedy. Special care, report of cases, and isolation, however, have brought about conditions in Boston, at least, that have greatly reduced the mortality. This is shown by the statistics prepared by Dr. McCollom: the decrease in mortality per 10,000 has been from 2.88 during the period from 1886 to 1894, inclusive, to 1.63 during the period from 1895 to 1907, inclusive; and the decrease in morbidity from 33.97 during the period from 1886–to 1894, inclusive, to 25.35 during the period from 1895 to 1907, inclusive. The history of the last hundred years, suggests, however, that a period of greater mortality may recur.

The important points for the prevention and control of scarlet fever are first of all complete registration of all cases kept by the school authorities or the Board of Health, careful medical inspection to detect the disease in the early stages, exclusion from school of other members of the family as well as the sick child, the following up of cases by school nurses, and, withal, special care that mild cases do not pass undetected. W. H. B.

See Contagious Diseases; Infectious Diseases; etc.

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SCHAUMBURG-LIPPE, PRINCIPALITY OF, EDUCATION IN. — See German Empire, Education in.

SCHEDULE OF SCHOOL STUDIES. — See School Management.

SCHELLING, FRIEDRICH WILHELM JOSEPH VON (1775–1854). — One of the greatest philosophical teachers of Germany, was a precocious but inconsistent thinker and writer. At the age of fifteen he won the master's degree at the University of Tübingen, and at twenty had published two remarkable philosophical treatises which made him famous and got him the soubriquet of "the boy-Plato of Germany." At twenty-three he became professor of philosophy at Jena, and later on occupied the same chair at Würzburg, Erlangen, Munich, and Berlin, thus making the almost unparalleled record of fifty-six years as an university professor. He had the lively imagination of a poet, rather than the critical intellect of a philosopher. He was a great master of the art of eloquent disquisition, and his lectures (richly illustrated from the results of a wide range of reading and some scientific knowledge) fascinated his hearers, even when his tendency towards mysticism made them difficult of comprehension. The works upon which his fame depends were all published before he was thirty years old. They exerted an important influence upon the development of German philosophy, literature, and science. The most important were the *Philosophy of Nature* (1797), *System of Transcendental Idealism* (1800), and *Philosophy and Religion* (1804). His philosophical views were as varied as his university experience, as he was in swift succession a follower of Fichte, Spinoza, the Neo-Platonists, and the modern Mystics. His philosophy really consisted of two distinct systems, connected by a common principle: the first transcendental and ideal, in which thought precedes being; the second realistic, in which being precedes thought. He himself described the former as his "negative" and the latter as his "positive philosophy." He presented his conceptions of higher education while outlining in popular form his system of philosophy in his *Lectures on the Method of Academical Studies* (1802; *Werke* V). During his later years Schelling was overshadowed by Hegel, his most famous disciple. W. R.

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SCHEM, ALEXANDER JACOB (1826–1881). — Joint author with Henry Kiddle (*q.v.*) of *Cyclopædia of Education*; was educated at the universities of Bonn and Tübingen in Germany. He was professor at Dickinson College (1854–1860) and assistant superintendent of the schools of New York City (1874–1881). W. S. M.

See Encyclopedias of Education.

SCHILLER, FRIEDRICH (1759–1805). — The great German poet has had an influence upon the education of his nation, the extent and depth of which can scarcely be measured, and this influence has been altogether and in the highest degree wholesome. His love of freedom and the lofty idealism with which not only all of his works are permeated, but which are equally exemplified by his beautiful life, have made him a favorite of the people, especially of the young. No other German poet is as truly national as Schiller. It has long been recognized that his works are especially adapted for purposes of education, as much on account of their ethical character as on account of their great literary value. Thus it has come about that generations of German leaders and thinkers at the most impressionable periods of their lives had their characters influenced by the dominant ideas of Schiller's works, — moral freedom, the striving after a harmony between the sensual and the rational nature of man, and a high conception of the dignity of humanity.

Schiller's direct contributions to education are also very important. They are chiefly contained in his philosophical essays, particularly in the essays *On the Esthetic Education of Man, On the Sublime*, and *On the Necessary Limits in the Use of Beautiful Forms*. In the *Letters on the Esthetic Education of Man* Schiller deals with the two fundamental "impulses" of man, the sensual impulse, which keeps changing him in accordance with the laws of physical nature, and the formative impulse, which arises from his rational nature and tends to maintain his personality. The two are harmonized by the impulse of free play, in other words by creative art, in which matter and form are fused in a higher unity, namely, ideal beauty. Art, therefore, becomes the most important means of a truly humanizing education. F. M.

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SCHLEGEL, AUGUST WILHELM VON (1767–1845). — German poet, Orientalist, and university professor. His essential educational services are threefold, viz.: as a translator, as a critic, and as a student of Sanskrit. As a translator he made Shakespeare, Calderon, and Indian literature known to the Germans in their own tongue; as a descriptive critic he marked emphatically the distinction between classical literature with its strict observance of the unities and the new and freer romantic literature; and as a student of Sanskrit he early helped to develop the science of language. Schlegel was not great as an original poet, being a man not of genius but of distinguished talent.

The rich, varied, and restless life of Schlegel may be briefly sketched in relation to his work. Son of a Hanover pastor, he was educated in the Hanover gymnasium and in the University at Göttingen, where he studied philosophy and theology. After serving as a tutor in the home of an Amsterdam banker, he became at thirty a professor at Jena, where, for five years, he translated seventeen of the plays of Shakespeare with classical success, contributed to Schiller's periodicals, and, with his brother Friedrich, the deeper and more versatile thinker of the two, conducted the *Athenæum*, as an organ of critical opinion for the Romantic school, and formed the center of a circle during the years 1796–1800, including Fichte, Schelling, Tieck, and W. von Humboldt.

From Jena Schlegel went to Berlin, where during the years 1802–1805 he lectured on art and literature, wrote the tragedy *Ion* in ancient style, and translated five of Calderon's plays from the Spanish, as well as Spanish, Portuguese, and Italian lyrics. His lectures have been translated into many European languages, and the work *De l'Allemagne* of Mme. de Staël, with whom he traveled through France, Switzerland, Germany, Italy, Spain, and Austria, shows the influence of his views.

The last period of Schlegel's life and work is marked by his removal to the University of Bonn in 1818, where he devoted his attention to Oriental studies, publishing his *Indische Bibliothek*, the *Bhagavad-Gita*, with Latin translation, and the *Ramajana*. The keynote of Schlegel's life, whether we think of his English, Spanish, and Indian translations, his devotion to medieval standards of work, or his separation soon after marriage from each of his two wives, is his romanticism.

H. H. H.

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SCHLEIERMACHER, FRIEDRICH DANIEL ERNST (1768–1834). — A distinguished German theologian, philosopher, pastor, and educator. As a theologian, he rejected both formal orthodoxy and rationalism in religion in favor of an emotional synthesis based on the mystical feeling of dependence. As a philosopher he reconstructed Spinoza and Kant independently from the Platonic standpoint. As a pastor he commended the Christian religion to all classes in Berlin through his broad sympathies and comprehensive insight. As an educator he assisted in founding the University of Berlin, and perhaps first of all struck the distinctly modern note in his writings on the social interpretation of education. On this point he deserves a careful monographic study in English. In all his theoretical and practical labors Schleiermacher was essentially a mediator between conflicting views, harmonizing them by deeper synthesis.

His life was one of tireless activity. Son of a Prussian army chaplain, he was sent as a youth by his orthodox father to two Moravian schools, where he welcomed the inspiration that came to his religious nature but rejected the theological teachings with which it was associated. He won a painful consent from his father to attend the University of Halle, where for three years he studied critical theology and Greek and Kantian philosophy. After serving as tutor for two years in a cultured and aristocratic household, he was for six years chaplain of the *Charité* Hospital in Berlin, reading widely at the same time and perfecting the outlines of his philosophical and religious systems. Without becoming a romanticist, he was profoundly affected for a time by Romanticism, the influence of which appears in his signal work, *Reden über die Religion,* 1799, new ed. 1879. In his ethical *Monologen,* 1800, he sketched his views of the individual and social relations in their future reconciliation.

In 1804 he began a three-year period of service at the University of Halle as professor and university preacher, winning both severe criticism for his " Spinozistic " views and great popularity, and beginning at the same time his life-long labor of translating Plato. In 1807 he moved to Berlin, where for twenty-four years he was to serve as pastor of Trinity Church, as professor in the new University of Berlin, and as secretary of the Academy of Sciences, showing himself, with Fichte, an inspiring patriot in those troublous days. Though preaching every Sunday, in his university lectures he covered in succession all the main theological and philosophical subjects, including pedagogy. Many of his numerous works exist to-day only as posthumous collections from his own and his students' notebooks. H. H. H.

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SCHLETTSTADT. — See Renaissance and Education; Beatus Rhenanus; Sapidus, Johannes; Wimpheling, Jacob.

SCHMIDT, KARL (1819–1864). — German educator, born at Osternienburg, Anhalt, and educated at the gymnasium at Cöthen. He studied theology at the universities of Halle and Berlin and in 1845 was appointed teacher at his old school in Cöthen, where he remained, with a short interruption, until 1863. In that year he became country school inspector and principal of a normal school in Gotha and was responsible for a new school law. He was a student of anthropology and sought to enlist its results in the service of education. He wrote *Buch der Erziehung* (1854); *Anthropologie* (1863); *Gymnasialpädagogik* (1857); *Geschichte der Pädagogik* (1860–1862); and *Geschichte der Erziehung und des Unterrichts* (1860).

See History of Education.

SCHOLARSHIPS. — **England.** — The early history of the English scholarship system has been treated under Exhibitions. The present article is intended to describe the educational significance of the system as it exists to-day. Scholarships are maintained in order to enable boys and girls to obtain a more advanced form of education than their parents can afford to give them at their own expense. A scholarship may consist in free, or partially free, tuition in a school where fees are normally charged, or it may take the form of a money grant, which after paying the school fees leaves a margin for the holder's maintenance expenses. A system of scholarships, therefore, differs from a system of free secondary and higher education in that it gives assistance only to selected children; but on the other hand, the assistance given may be more adequate to the needs of the individual child than that afforded by free admission to a secondary school or university.

This complex social development has necessarily determined the organization of the English schools and universities. The elementary schools are open without fee to the children of all classes, but the type of education given in them is more particularly designed for children of the wage-earning groups. The secondary schools and universities, on the other hand, are intended primarily to meet the needs of the various social groups above the unskilled labor class, and they, therefore, normally charge fees which vary according to the average income of the group with which the school or university is specially connected. Thus, for instance, among schools for boys, we have the great public boarding schools, charging £100 or more per annum, frequented by boys from wealthy homes and the sons of successful business or professional men; the large first grade day schools in the principal towns, with tuition fees of from £12 to £20, catering for what may be called roughly the middle and upper-middle classes; and, thirdly, municipal schools and cheaper grammar schools, with fees of from £3 to £10 a year, attended mainly by the children of shopkeepers, clerks, well-paid artisans, etc.

Such a system of schools represents on the whole the conservative aspect of English society. Under favorable conditions it meets the needs of the average members of the various social groups. But it tends to prevent able children of limited means from obtaining education superior to that of the normal members of their group. In particular it tends to confine any form of secondary education to children whose parents can afford to keep them at school until at least fifteen or sixteen years of age, paying the school fees and other necessary school expenses, while higher secondary and university education is made possible only for the few. Such a result would be calamitous from two points of view. In the first place, it would preclude many children from being trained for positions suited to their abilities, and in the second place it would prevent the skilled callings and higher social groups generally from obtaining an adequate number of well-qualified recruits. To obviate this difficulty scholarships are maintained both with the object of enabling comparatively poor but able children to obtain the educational opportunities necessary for the full development of their powers, and also with the object of recruiting the callings which demand an extended course of professional or technical preparation. The former class of scholarships is the educational correlative of the desire to increase the vertical mobility of society; the latter gives expression to the equally insistent desire to increase the efficiency of the community by raising the standard of professional and technical attainment.

In recent years both these desires have been stimulated in a marked degree. More parents have come to recognize the desirability of obtaining for their children an education which would fit them for rising in the social scale. In particular the growing economic, political, and social importance of the group represented by the skilled artisan has led the members of this group to demand wider educational opportunities for their children. Hence it was not surprising that when by the Act of 1902 the County Councils were constituted the local education authorities for their respective areas, these councils should have established an extended system of scholarships, by which children might be enabled to pass from the elementary to the secondary school and in some cases to the university. It was equally natural that the Liberal government should in 1907 have supplemented this system of scholarships by compelling all state-aided schools to admit a large number [1] of elementary school children without charging them any fee. Here, therefore, we have one main branch of the existing system of scholarships, the branch which aims in the first instance at the provision of educational opportunities for individual boys and girls, though incidentally it helps to fill the secondary and technical schools and universities, and thus promotes the training of recruits for the higher industrial and professional callings.

In the second branch of the scholarship system this latter purpose is relatively more important. The higher standard of knowledge and technical skill now demanded in professional and industrial callings has rendered it imperative that opportunities should be afforded to actual or intending members of these callings to improve their educational equipment, and also that these callings should be recruited from a wider social area; for only in this way can an adequate supply of able members be obtained. Hence we find that the local education authorities establish scholarships to be held at technical institutions of various types and at all kinds of evening classes. And the same general motive has also led secondary schools, universities, and technical institutions to offer scholarships of their own. These latter scholarships aim in the first instance at attracting able boys or girls to the institutions by which the scholarships are offered, but in so far as this purpose is achieved an increase is effected in the number of persons educationally qualified for membership in the social groups with which the school or university is connected. Thus, for instance, the Oxford and Cambridge colleges offer a large number of entrance scholarships, awarding them to boys who appear likely to distinguish themselves in the university examinations. These scholarships really represent an effort on the part of the directive group to increase its own efficiency by offering appropriate training to able boys who would otherwise be excluded. Of the same general type are the entrance scholarships offered by the great public schools, which as a rule are gained by boys who have undergone a highly specialized course of training at a particular type of preparatory school, and also the leaving scholarships awarded by the public schools to boys passing from them to the older universities. Similar scholarships are offered by girls' schools and colleges for women, by middle-class secondary schools for boys, and by the local universities and technical institutions. It is clear that all the scholarships of this type tend to increase the opportunities of individual students, but a detailed study of the conditions of competition and the methods of award leads to the conclusion that the primary motive is the promotion of group efficiency.

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[1] Normally 25 per cent of the total number of children admitted.

It is impossible to state either the total number of scholarships awarded annually or the total expenditure involved, but the following figures will give some idea of the magnitude of the system as a whole. The total expenditure of the local education authorities in England, excluding Wales and Monmouthshire, upon aids to students in secondary schools, preparatory schools, and pupil teachers' centers during the last three years for which statistics are available was as follows: (*Statistics of Public Education in England and Wales*, Part II (C.D. 5506, p. 91)): 1906–1907, £346,583; 1907–1908, £372,047; 1908–1909, £435,237. To these figures must be added the amount granted by these authorities in aid of students in technical, art, and evening and similar schools and classes, viz.: 1906–1907, £78,074; 1907–1908, £85,531; 1908–1909, £94,795.

Since the introduction of the system of free places for elementary school children in state-aided secondary schools[1] the number of such children has consistently increased. The following are the figures for the last three years for which they are obtainable, (*Statistics of Public Education*, Part I (C.D. 4885), p. 137; (C.D. 5355), p. 116; and (C.D. 5843), p. 116), viz.: 1907–1908, 33,571; 1908–1909, 40,682; 1909–1910, 44,681. These children comprised roughly 30 per cent of the total number attending the schools. Some of them held County Council or other scholarships, but the large majority were "free placers."

The number of scholarship holders other than ex-public elementary school children in these secondary schools was as follows: 1908–1909, 4244; 1909–1910, 3720. The expense to the schools of the education of these scholarship holders and "free placers" cannot be accurately ascertained, but the cost in fees excused must have amounted to something like £300,000 per annum. Some part of this cost was met by grants from the Board of Education.

The value of the scholarships given by the public schools and other secondary schools not included in the government returns appears to be approximately £200,000 per annum. The entrance scholarships at the universities cost at least another £100,000, while the technical institutions and professional bodies maintain scholarships to the value of perhaps £20,000 per annum.

This would make the total annual expenditure upon scholarships amount to about £1,150,000, but, if we wish to ascertain the total cost of the education of the scholarship holders, a considerable further sum would have to be added, since in many cases fees paid on the scholarship holders' behalf do not represent the real cost of the education given to them.

The great variety of the scholarships awarded by the local education authorities is illustrated by the following list of scholarships offered for competition in 1911 by the London Education Committee, viz.: junior, intermediate, and senior county scholarships, trade scholarships for boys and girls, art scholarships and exhibitions, science and technology scholarships and exhibitions, scholarships for blind, deaf, or crippled boys and girls, exhibitions for apprentices in silversmithing, typography, and lithography, cookery scholarships for domestic servants, junior domestic economy scholarships and dressmaking apprenticeships, and mercantile marine scholarships. Besides these, they offered a variety of scholarships for intending teachers. (See LONDON, EDUCATION IN.)

In the case of scholarships offered by local education authorities the competition is usually restricted to children living in the area controlled by the authority, and in some cases other conditions are imposed, with a view to excluding the candidature of children not in need of financial help. The entrance scholarships of the public schools and universities were until recently open to all candidates under a given age,[1] with the result that university scholarships have come to be coveted as distinctions awarded for intellectual merit rather than as pecuniary aids. There is, however, a growing feeling that, while the honor of winning a scholarship should be open to all, the financial benefit should be reserved for those who really need it.

Scholarships as a rule are awarded on the result of a written competitive examination. It was only the traditional belief in the fairness and efficiency of this test of intellectual ability that rendered it possible to deal with the candidature of large numbers of children who had in some cases passed through very different courses of previous training. Experience has, however, shown that this method of award, though cheap and convenient, has serious defects, and efforts are being made in various quarters to supplement it by a consideration of the candidates' previous school records, by an oral examination, or by other means. (See EXAMINATIONS.)

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[1] These schools numbered in 1907–1908, 739; in 1908–1909, 807; in 1909–1910, 841. (C.D. 5483 p. 107.) The majority of them are schools for the middle classes.

[1] Nineteen years at Oxford and Cambridge.

The effects of this great system of scholarships are so varied and far reaching that it is impossible here to do more than mention a few of the most obvious results. There can be little doubt that scholarships have enabled a large number of promising children to obtain an education commensurate with their powers; in particular many such children have been given the opportunity of attending secondary schools. Scholarships have also proved an effective instrument for recruiting professional and technical callings. Incidentally they have brought elementary and secondary schools into close touch with each other, though they have not been so effective in bridging the gulf which divides English educational institutions into two great groups, the group represented by the elementary school, the lower-grade secondary schools, and the technical schools and colleges, and the other group represented by the public schools, their preparatory schools, and the older universities. In fact, the keen desire of the public schools to win scholarships at the universities has encouraged them to spend their strength upon highly specialized teaching in classics, mathematics, and pure science, and so to maintain their attitude of educational exclusiveness. Again it seems certain that much money has been wasted, partly by the award of scholarships to candidates who are comparatively well-to-do, partly by the encouragement given to children of moderate ability to prepare themselves for callings for which they are unsuited; many boys who would have become good artisans have been turned into second-rate clerks. This latter evil has been intensified by the methods of award, which have tended to give prominence to book learning at the expense of practical constructive work. It would also appear that in many cases secondary schools have suffered from being flooded with a larger number of free scholars than they could absorb into their corporate life.

Speaking generally, the English scholarship system has helped to tide over a period of educational reconstruction due to a rapid change of social conditions, but it has tended to absorb funds which might have been more usefully employed in improving the education given in the schools, and especially in raising the salaries of the teachers. It is probable that the next few years will witness further educational changes, and as a national system of schools and universities is evolved, the present scholarship system will probably be greatly modified, even if it continues to be a characteristic feature of English education. H. B. S.

United States. — Since both elementary and secondary schools are free throughout the states and have been in most regions for two or three generations, scholarships are only of importance in connection with higher education. The scholarship system is a direct descendant of the early practice of waiving or reducing the tuition fee in the case of needy students. Indeed, in many colleges and in some universities this is still the method. The more carefully organized institutions, however, have realized that this informal arrangement renders it impossible for the institution to keep its books intelligently, and it has therefore become the custom to collect fees from all students, but to set aside in the budget a specified amount for scholarship aid. At Columbia this amount varies from year to year, being, for each faculty, 10 per cent of the fees collected in the previous year. There are usually two types of collegiate scholarships, one awarded as the result of formal competition, usually the relative standing in entrance examinations, and the other in which the student's need and his " promise of future usefulness " are both taken into account. In the past there have been accusations that scholarships of the latter type have been used to attract students whose athletic prowess was more striking than their intellectual ability, but with the general improvement in the athletic situation within the last few years, less has been heard of these charges.

A recent development is the coöperation of the alumni of an institution who live in any given district in maintaining a scholar from that district at their *Alma Mater*. The Harvard and Yale clubs of San Francisco, for example, maintain scholarships for California students at Cambridge and New Haven. An interesting type of scholarship is that maintained and at his death endowed by Joseph Pulitzer, giving a stipend of $250 to forty undergraduate students each year. In recognition of a separate gift to Columbia University, that institution provides in addition free tuition for these scholars.

Some type of scholarship provision is maintained in most of the endowed preparatory schools, and in the more fashionable schools, like Groton and Hotchkiss, these scholarships are deliberately used to prevent the danger of exclusiveness in the student body.

There is no real distinction between graduate scholarships and those in the professional and undergraduate departments, except that the former are ordinarily announced as public academic honors and are usually held for but a single year, whereas the latter are more likely to be confidential and to continue throughout the course. The stipend in either case seldom covers more than the tuition charges; and there is no restriction as to outside employment. F. P. K.

SCHOLASTICISM AND THE SCHOOLMEN. — Scholasticism as a system of philosophy and theology was an effort to express in clear and definite form what was present in the consciousness of medieval Latin Europe. It dealt with the divine as well as the human, with the theological and ecclesiastical matters as well as with questions of philosophy and natural science. At the same time it did not fail to distinguish between these two orders of truth, one of which it called revelation and the other, reason. While it was of the essence of scholasticism to maintain the agreement of the two, it was equally essential to hold that there is a distinction between them. Mysticism (*q.v.*), which exaggerated the importance of the divine element in our experience, and rationalism, which laid undue emphasis on the human element, both contributed to the final form of scholasticism. And in that final form both were combined in such a way as neither to minimize the value of divine authority nor to deny to human reason its legitimate rights. It is necessary to call attention to this trait of scholasticism because the modern critic too often overlooks it, although it seems to be so strikingly evident. Either he accuses scholasticism of undue subservience to authority or represents it as an ambitious attempt to rationalize all religious as well as purely scientific truth.

The presence of the divine element in scholasticism was determined by the traditional doctrine of preceding centuries (the Patristic age), the contents of the Scriptures, and the official decrees of the church. These were accepted as matters of belief, then, as always, by all devoted members of the Catholic church. What was peculiar to the scholastics was their refusal to maintain these tenets as matters of belief, merely, and their consequent effort to render them reasonable by demonstration, or analogy, or at least, in a negative way, by answering the difficulties and objections of unbelievers. The human element in scholasticism was supplied by the experience of the scholastics themselves, but to a larger extent by the literature handed down to them, and most of all by the works of Aristotle, as soon as those works became known in Western Europe. The scholastics were curious about nature, but not critical. They excelled in the ability to grasp the meaning of principles, but in their estimation of facts they were too often credulous and readily believed on the authority of others when they should have been more inclined to investigate on their own account.

These factors determined the scholastic method of teaching and explain both the shortcomings and the peculiar excellence of that method. The scholastics were called upon to arrange, interpret, and expound the heritage of the preceding centuries, both in theology and in philosophy. Besides, they felt called upon to show the harmony existing between these two kinds of knowledge. For this reason, they laid emphasis on dialectic, they adopted the Aristotelian logic and applied it to the task before them. Thus they brought to a high degree of perfection the art of formal definition and deductive argument; they excelled in the interpretation and exposition of texts; they attained an extraordinary skill in the use of words and in subtlety of distinction. With these advantages, however, went the natural defects of those qualities, the neglect of observation and original research, the depreciation of scientific experiment and of historical investigation. Not that the schoolmen condemned the study of nature or lacked a sympathetic interest in natural phenomena. It was their misfortune that they were too much taken up with the elucidation of their predecessors to afford time for the direct ascertainment of facts. There are, indeed, notable exceptions to this statement. Albert the Great and Roger Bacon showed what could be done by the use of the inductive method. They, however, were exceptions to the general spirit of the age, which was one of interpretation, elucidation, and deductive demonstration, and not of personal research.

The scarcity of books in medieval times contributed in a lesser way to influence scholastic method. It necessitated the reading of texts by the teacher and the dictation of his explanation, or commentary. In law, medicine, physics, and politics, as well as in theology and philosophy, the starting point in the lesson was a portion of some text. The words of the text were explained, the "sentence" or opinion contained in the text was compared with other "sentences," or opinions; proofs or analogies were furnished, examples or applications were given, and objections, difficulties, or reasons to the contrary were recited, explained, and refuted. There were many divergencies of method in matters of detail. Essentially, however, this was the line generally followed in all branches of education in the scholastic era. To the use of this method are due, as has been said, the manifest shortcomings of scholastic education; but to the use of it are due also the undeniable advantages of scholastic training. There can be no question of the suitableness of this method to the needs of the age which employed it. It taught the medieval scholar to think; it taught him to distinguish very carefully the meanings of technical words; it taught him to systematize his knowledge; it taught him to demand the harmonious adjustment of knowledge and to fit into his scheme of the universe both the natural truth which he learned from Aristotle and the other ancients and the supernatural truth which he accepted on the authority of God and of the church. The best results of this method are seen in the mental development of Dante and in the many excellent qualities of mind which the humanists inherited from the scholastic era. It is generally acknowledged that whatever precision the languages of Western Europe possess they owe to scholastic habits of thought. It should be just as generally admitted that not only the humanists but many of the scientific discoverers who inaugurated the modern era owed much of their vigor and freshness of thought to the scholastic training which they received. Though they realized the defects of the scholastic method and condemned them, they were indebted to that method far more than they were willing to acknowledge. W. T.

The Schoolmen were the most noted of the scholastic teachers and writers but the term includes more specifically all the great teachers from Scotus Eriugena (ninth century) and Peter the Lombard in the twelfth century to William of Occam in the fourteenth. The definite setting of the conflict between Nominalism and Realism (*qq.v.*) in the eleventh century, between Anselm (1034–1107) and Roscellinus (d. 1106), was the beginning of the great group of schoolmen. They were followed by Abélard (1029–1142), and he by a great group, among the most prominent of which were the following. Alexander of Hales (d. 1245) was the first to be acquainted with the entire philosophy of Aristotle and to employ it in the review of theology embodied in his great work, *Summa Theologiæ*. Vincent of Bauvais (d. 1264) was an encyclopedist. Bonaventura (1221–1274), *The Seraphic Doctor*, a Platonist rather than an Aristotelian in his philosophy, represented as did the Victorines of the preceding century the mystical tendency in thought and education. Albertus Magnus (1193–1280), called *The Universal Doctor*, was the first to reproduce the philosophy of Aristotle in systematic form and with constant reference to the Arabic commentaries that constituted so large a part of the new knowledge of the times. Thomas Aquinas (1225–1274), *The Angelic Doctor*, was the most influential of all. In his great work (pp. 298–299), he represents the culmination of scholasticism and is its authoritative exponent, both in that period and in subsequent times. Joannes Duns Scotus (c. 1271–1308), *The Subtle Doctor*, was famous as a founder of a school of theology rivaling that of Thomas; his work, however, was rather of a critical and negative than of a constructive character. The long line of great schoolmen was closed by William of Occam (1280–1347), *The Invincible Doctor*, who revived again the nominalist views.

For the specific works and influence of all of these, see the separate biographical articles under the proper captions in this work.

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SCHOLASTICUS. — The official representative of the church in educational matters in the Middle Ages. Other titles borne by him were *Magister Scholarum*, *Archischola*, or *Ecolâtre*. Originally the *Scholasticus* himself taught, but as his duties became more and more multifarious, he devolved this duty on a schoolmaster.

See Bishops' Schools; Cathedral Schools; Chancellor's Schools; Church Schools; Teachers, Licensing of; Monasticism and Education.

SCHOOL. — There is perhaps no more remarkable instance in the history of language of the perversion or conversion of terms to express the very opposite of what they originally meant than that of the word school. Originally denoting leisure, spare time spent in rest and recreation, it has come to be the technical and common word for that scene of continuous activity and strenuous business, the place of education of boys and girls. It is strange, too, that though the word school, like the thing, descends to us straight from the Greeks of the classical time, the Attic Hellenes, it was never used by the Greeks themselves to mean that thing. Among them *scholê* meant no more than rest, and to have *scholê* was to take things easily. A school in Hellas was called *didaskaleion*, a teaching place. It was not till the Alexandrian age that it was distinguished as a *grammateion*, a *mouseion*, or a *palaistra* or *gymnasion*, according as it was a grammar school, a music school, or a school of physical training. In point of fact there was no regular word for a music school and, *mouseion*, meaning a temple of the muses, is only used by way of metaphor. The idea of *scholê*, leisure, in connection with education is due to the fact that in Greece schools began at the top. The first organized teaching establishments were those of what we should call the university order of education. The discussion forums or talking shops which sprang up in the suburban gymnasiums (*q.v.*), where the gilded youth of Athens spent their leisure time in sports and exercises in training for war, gradually crystallized into schools of philosophy and the higher arts. Their origin is described by Milton with his usual felicity when he asks Melancholy to bring with her "retired Leisure That in trim gardens takes his pleasure." In the leisure spent in the trim gardens of the Academy, schools developed. Appropriately enough, Plato is said to have been the first person to use the word *scholè* in anything approaching an educational sense. In a passage in *Laws* (*c.* 320 B.C.) he speaks of certain mathematical matters as fit for the leisure of old men, and for contention in disputations (*scholais*) fit for them, but it is by no means clear that the true translation is not "in pastimes suitable to them." A passage in Aristotle's *Politics* (IV, i) in which he dismisses the question of the identity in the causes of prosperity of the state and the individual with the remark that it is "a matter for another discussion" (*scholais*), appears to show that the word was already beginning to be appropriated to the method used in philosophical leisure. The first undoubted use of the word in Greek in the sense of school seems to be in Dionysius Halicarnassus, *c.* 30 B.C., when, in the letter to Ammaeus (I, vii, ad fin.), he speaks of Aristotle as having been till the age of thirty-three with Plato and neither the leader of a school (*scholès hegoumenos*) nor having established any philosophy of his own. Here it is a school of thought that is spoken of, not a school as a place of education. Plautus, however, *c.* 213 B.C., uses the Latin word *ludus*, which properly means sport or pastime, in his plays, which are often translations or adaptations of Greek plays, as a translation of *scholè* in our sense of a school. So it would appear that the word was already in current use, if it did not appear in literature. Plautus talks of "going to school," the grammar school, *ludum literarium*, to which the old gentleman in the Mercator began to go and had already, on his first day, learnt to spell a three-letter word, *amo*, I love, while in the *Rudens* a young man falls in love with a girl whom he sees going to the lyre school (*ludum fidicinum*).

Though *ludus* is used freely in the classical Latin authors for school, *schola* is almost equally common. From the fact that in medieval times the word *ludus* was practically unknown, or at least very seldom used, and that *ludimagister*, the word used by Cicero and Martial for schoolmaster, also went out of use, while *schola* and *scholarum magister* are universal, it would appear that at Rome and in the Roman lands, in current talk, the Greek word *schola* and not its Latin translation was commonly used. This is borne out by the fact that the gilds, mainly of the artisans and the common people, the religious gilds, burial clubs, and the like, dedicated to various gods and goddesses, were commonly called, not by the ancient Roman and aristocratic name of *Collegium* (*q.v.*) but by the Greek word *schola*, and the Code recognized the schools of the scriveners, (*schola chartulariorum*, not the equivalent of *Ecole des chartes*), of the butchers, shoemakers, and so on. Their buildings too were called *scholæ* (see Baldwin Brown's *From Schola to Cathedral*). The Jews used the same word for their synagogues. Quintilian, A.D. 90, used the word *schola* exclusively in his celebrated discussion as to whether boys should be brought up at home or in schools, and Jerome, *c.* 300, speaks of Quintilian as being the first to teach a public school. Owing partly to the fact that the early councils of the church were held in the Western Empire and conducted in the Greek tongue, the word *schola* became the practically exclusive word for school. When translated into Latin in Italy school appears rather as *studium*, as in Pope Eugenius II's edict in 826, then as *ludus*. Wherever schools are mentioned in the early canons the word *schola* is used. Schools were apparently unknown to Western and Northern Europe before the coming of Christianity. At all events in all the Teutonic, as in the Romance, languages the word for school is some variant of *schola*. The Irish Saints' Lives, if any of them can be accepted as really representing writings before the Christianization of England, invariably used the word school. The earliest authentic Western writer who mentions the thing, Bede, writing in 735, and speaking of the year 631 and of Sigberct, King of the East English, says that he instituted a school, *scolam*. In the form *scola* without the *h* the word invariably appears in English, French, German, and Italian writers up to the Renaissance. Why the *h* disappeared in the mouth of the English Bede it is hard to understand, the race that would call white "hwit" could have had no difficulty with the aspirate. But presumably it had disappeared in the mouth of the Gallic Celts before. The only early passage in which the word *ludus* is used is in that vilely affected writer the pseudo-Asser, who in the *Life of Alfred* speaks of his sending his younger son to the grammar school in the phrase, *ludis literariæ disciplinæ*, and he goes on to speak of that school, *in qua scola*. Aelfric in his *Colloquy*, being perhaps also anxious to show off, translated "learning" into *gimnasium*, a subsequent Renaissance affectation permanently adopted by the newly-learned Germans at the Reformation. But in his grammar Aelfric talks naturally of the School of Ethelwold (*Scola Adelwoldi*) at Winchester.

The use of the word *ludis* in the plural by pseudo-Asser for apparently a single school is the first instance of that which became the common usage from about the year 1100 to the year 1540. Throughout that time the plural *scole*, *scolas*, was used for "a school" or "the school," especially in formal or official documents. One of the earliest instances is in the foundation of Eye Priory between 1076 and 1083, when Robert Malet granted to the priory "the church of Eye and all the churches in the neighbouring town of Dunwich and the school (*scolas*) of the same town." Another early instance is in 1114, when Bishop Herbert of Lozinga of Norwich took back from the monks, who had been placed in the ex-cathedral of Thetford, the governorship of the school and restored to Dean Bund and the secular clergy, "his school, *scolas suas*, at Thetford as he had most fully held it" and forbade any other school there. So too in the grant about the year 1111 to St. Paul's School; the bishop of London confirms to Hugh, schoolmaster (*Magistro scolarum*) and his successors *ex officio* (*ex magisterii dignitate*) a house or school-house by the Bell Tower, and to him also *ex officio* (*scholarumque privilegio*) the privilege or liberty of the school, the librarianship or custody of the books of the church. This is perhaps the earliest use in England, at all events, of the term *Magister scolarum* for the master of a single school. It is one of the most conspicuous examples of the misunderstanding of the whole history of schools, which has arisen from not recognizing that the plural is used for the singular. Bishop Stubbs misinterpreted this document in consequence into the founding of St. Paul's Schools, and the supposition that there were more schools than one, apparently a song school as well as a grammar school, under this master, and the consequent implication that the medieval schools generally were mainly choristers' schools. Fortunately the statutes of St. Paul's themselves carry the refutation of the mistake with them. For while the original writ of Henry of Blois, Bishop of Winchester, acting Bishop of London from 1138 to 1140, directs the chapter and the archdeacon of London to pronounce sentence of anathema against any one lecturing in London without the license of Henry, schoolmaster (*Magister scolarum*), except those who keep the schools of St. Mary-le-Bow and St. Martin's-le-Grand, the statutes written in 1250 explain that under the Chancellor (to which title that of schoolmaster had been changed in 1205) are all the scholars living in the city except the scholars of a school of St. Mary-le-Bow (*unius scole de Arcubus*) and a school (*unius scole*) in the Basilica of St. Martin-le-Grand. An appointment to the mastership of this single school at St. Mary-le-Bow in 1390 is preserved in the Archbishop's register at Lambeth, and it is talked of throughout in the plural. The master is *rector scolarum grammaticalium*, the keeping the school is called *regimen scolarum*, and the appointment is said to be *prefeccio magistri in eisdem*, not *in eadem*. So in 1446 Henry VI speaks of the one grammar school founded in the "Roiall College," of Eton as a public general grammar school (*publicas generales scolas*) and gives the same school (*eædem scole*) a monopoly in Windsor and for ten miles round Eton. The use of the word school in the singular did not wholly disappear, as we find for instance in the Bursar's Rolls, the accounts of Winchester College, the schoolmaster called sometimes *Magister scolarum*, sometimes *Magister scole*. But until about 1480 the use of the plural especially in formal documents is almost exclusive. What the origin of the use of schools in the plural instead of the singular may be it is difficult to say. It is possible that it was due to a little knowledge of Greek proving a dangerous thing and the Greek singular *scholé* being mistaken for the Latin plural written at that time not *scholæ* but *schole*. The usage certainly disappeared at the time when a knowledge of Greek again became common. But on the whole it seems from the date when the usage became common that it was due to the rising universities of Bologna and Paris, where there were more schools than one, and the teaching masters, the *magistri legentes* or *regentes*, were not confined to teaching one school, but were generally "masters of the schools" which constituted the studium generale. As the university set the fashion, the master of the cathedral and other grammar schools followed suit, and called themselves (as they generally were university regent masters in arts), *Magistri Scolarum*, and the one school of which they were masters, being the scolarum in question, by parity of reasoning, became dignified also with the plural. The usage died out when English began to supersede Latin. We find, for instance, ex-Lord Mayor Percyvall founding "a Fre Gramer Scole," at Macclesfield, in 1503 by a deed in English and naturally using the singular. Perhaps Colet's deeds in Latin in 1510 relating to the transfer of the old school (*antiqua scola*) of St. Paul's and its rights, and their merger in the "newe scole" he was founding, are the first formal documents emanating from high ecclesiastical authority in which the singular is used. A little later the introduction of Plautus as one of the commonest books to be read in schools, and the spread of Greek, introduced the use of the Latin *ludimagister* and the Greek *archididascalus* for schoolmaster, and the word *ludus* for *schola* in Latin documents. But the latter word was too deeply rooted to be driven out. The retention of *scola* in the legal formula adopted in Henry VIII's and Edward VI's refoundations of the old schools as *libera scola grammaticalis* or free grammar school, settled the usage. Grammar school or free school remained the common as well as the technical term for a school in England, which was thus spared the gymnasia of Germany, the academies of Scotland, and the lycées of France. Since the eighteenth century the prefix of grammar or free has been dropped, and the word school *simpliciter* with the territorial addition of the name of the place, as

Westminster School, Ipswich School, reigns as it did in the twelfth century. A. F. L.

See College; Grammar School; Gymnasium; High School; Public School.

SCHOOL AGE. — See Attendance, Compulsory; Backward Pupils; Census, School; Child Labor; Grading and Promotion; Retardation, etc.

SCHOOL AND COMMUNITY. — See School as a Social Center.

SCHOOL AND LIFE. — See Course of Study, Theory of; Education; Values; School as a Social Center.

SCHOOL AS A SOCIAL CENTER. — According to common usage this title refers specifically to an institution recently established in a number of American cities which provides within the school premises but outside of the day class hours, various social, recreational, and cultural opportunities for the people of the neighborhood. In a larger sense, it denominates an educational viewpoint whose definition may be due to sociology, but whose present currency has largely resulted from the increased burdens which society, impelled by vast changes in living and industrial conditions, has laid upon modern school systems. Viewed from this standpoint, the public school presents two fairly distinct aspects: (1) as the agency for preparing the immature for efficient membership in society, and (2) as the operative or administrative center for various services of immediate benefit to the community as a whole. In general, the former corresponds to the day school proper and the latter to all the other activities not connected with the day instruction that take place on the school premises, among them being the "social center" to which reference has been made. Actually there is not a strict coincidence between the two functions and these two sets of activities, but the latter are so distinct administratively and so separate in public thought that clearness is gained by dividing the discussion upon this basis.

(1) Under the influence of the ideal of an "education related to life" which has been especially effective during the past few decades the social efficiency of the public school system has, in the more progressive communities, been vastly increased.

Through an enrichment of the content of instruction and a closer adaptation of it to the specific needs of the individual, the modern school is giving a more adequate preparation for the responsibilities and opportunities which are encountered in a highly specialized civilization.

An unconscious preparation for the life of the outside world is given to the pupil merely through his living, during school hours, in a miniature community. In the process of making place and providing suitable equipment for all its new activities the school plant has grown greatly in size and the school life has become wondrously diversified. With its shops, kitchens, lunch rooms, sewing rooms, laboratories, museums, libraries, stores, banks, offices, newspaper plants, assembly rooms, gymnasiums, armories, swimming pools, playgrounds, and gardens, the modern school has become a more complete microcosm of society than is found in any other single institution.

Certain features of the public school regimen have important effects upon the adult portion of the community as well as upon the children. Medical school inspection not only reduces the amount of communicable disease among the pupils, but prevents its spread generally. The attitude toward the care of the body which is incidentally imparted by the frequent examinations of the eyes, ears, teeth, throat, skin, and weight, is carried by the pupil to his family along with other hygienic facts taught in his classes. The school nurse in her visits to the homes is constantly spreading health information and lifting the standards of domestic sanitation. On account of the school's influence and machinery, health officials, anti-tuberculosis societies, and similar organizations often seek its aid in waging special campaigns, and eminent authorities have proposed its use as a permanent local health office. Other municipal officials have obtained the school's coöperation in organizing street-cleaning squads among the boys, and the problems of street beautification have also been attacked through the same agency. The tendency to prosecute reforms of various sorts through the school is further illustrated by the effort to secure fire prevention pledges from pupils and by the frequent proposals to set aside certain days for exercises in behalf of some cause. Peace Day, Mothers' Day, Clean-up Day, Health Day, Bird Day, and Conservation Day are some of the occasions which have been urged as entitled to the same observance that is accorded to Arbor Day.

The expansion of the school plant is partly the result and partly the cause of an extension of its usefulness in several other ways. The establishment of kindergarten activities not only brought a younger group of children within the range of public education, but it added to the school building a room which was suitable for many recreational and social occasions that were impracticable in a classroom. When the mothers' clubs which first met in the kindergartens grew into large parent-teacher associations the need of an assembly room was so emphasized that it now forms a part of most new elementary buildings. The amount of the school's service to young people in general has been increased by the establishment of vacation schools (*q.v.*), and organized play (see Athletics) in schoolyards, and evening recreation centers. Through the evening schools (*q.v.*), with their English for foreigners and further education for natives, through the public lectures, social centers, and the meeting of various organizations in class and assembly rooms, school facilities have not only received an augmented social effectiveness, but their benefits have been extended to a class of older people.

(2) The location of the school building in the center of a neighborhood and its close contact with the families of the district make it a natural point of distribution and administration for a number of community activities. In a half dozen or more cities the polling of votes takes place in schoolhouses and in others they are opened for the public discussion of proposed constitutional amendments and similar matters pertaining to direct legislation, while in rare instances they are used for the holding of political caucuses. Partisan political rallies have been permitted in some of the school edifices of New York, Chicago, Jersey City, and one or two other cities. In a growing number of places branches of the public library, open to the neighborhood during and after class hours, are maintained in school buildings. Museums are also beginning to find a place in the schoolhouse, while in the high school at Richmond, Ind., there is an art gallery for which the municipality makes an annual appropriation of $1000 with which to purchase new pictures. A yearly exhibition of paintings is held, to which many well-known artists send their work. Professor Commons has recently outlined the plan of a national employment bureau the branches of which would be located in the schoolhouses. Here the laborer would register his need of work and here, a few days later, he would receive information about the places where his services were in demand. The high school at Coldwater, Mich., has a "work bureau" for boys who want to do odd jobs after school hours and on Saturdays, while many of the technical and commercial schools make systematic efforts to find suitable positions for their graduates.

The community services so far enumerated in this section are sporadic, and not yet fixed in form or scope. They are beginnings rather than mature developments. The school social center, however, is an institution which has attained considerable definiteness and the dignity of a separate staff to conduct its activities. In the course of its development three fairly distinct phases have appeared. These are represented by the "educational center," "evening recreation center," and "social center."

Educational Centers. — These were first opened in the spring of 1902 in two public schools of Boston, three more being established the following winter. They afforded young people and adults of both sexes evening instruction in a dozen or more branches mainly of a practical nature. There were classes in dressmaking, millinery, embroidery, and cooking for the women, and classes in carpentry, steam engineering, mechanical drawing, and civil service subjects for the men, while instruction in bookkeeping and stenography was furnished to both groups. There were also cultural courses devoted to such subjects as the American poets, civil government, and geology. A reading room equipped by the Boston Public Library was thrown open for general use, while the school hall was occupied by a large chorus and the gymnasium was the scene of a systematic physical training. The only provision for day pupils was a study room, which was enjoyed by members of the seventh and eighth grades. So far as practicable, the instruction was given in the form of "study lectures" and the atmosphere of informality made possible a considerable amount of conversation and the formation of new acquaintanceships. The pupils were divided into two sets, one attending on Tuesday and Thursday evenings and the other on Mondays, Wednesdays, and Fridays. The third season 132 teachers were employed in the five centers and the number of pupils registered was 8948. The centers were discontinued after the season of 1905-1906, but they had existed long enough to demonstrate the popularity of industrial and commercial education and to hasten its incorporation in Boston's public school system.

Evening Recreation Centers. — These have attained their highest development in the public schools of New York City where they were first established in August, 1899. The privileges afforded by each center consist of a gymnasium, a reading and quiet-games room, meeting places for clubs, and the direction needed for the intelligent utilization of each. At many of the centers swimming pools and baths are also available. Only those over the age of fourteen are admitted to the recreation center proper, though day pupils from the fifth grade up, who come with books and a card signed by their principal, are allowed to use a special room which is set aside for study and is under the supervision of a competent teacher. While the privileges are public, participation in the basket ball games and the organized athletics is restricted to the members of the clubs which meet at the center. These groups are recruited in the reading room and the quarters devoted to free play and quiet games, and the form their efforts shall take, whether literary, athletic, social, or civic, is left to their own decision. Twenty out of the fifty-four centers maintained in Greater New York at the present time (season of 1912-1913) are for the exclusive use of women and girls. In their athletic activities folk dancing has a prominent place, but they also play basket ball and, in general, enjoy the same privileges as the boys. Clubs whose members are sixteen years or over in age are known as senior clubs, and in several of the girls' centers the senior clubs are allowed to hold weekly dancing classes to which properly accredited boys from the neighboring centers are invited. These parties are under the supervision of the center staff and, with the exception of a small fee (generally five cents) paid by the guests for the services of a violinist to supplement the regular pianist, are free to the participants. The senior clubs of both classes of centers hold entertainments, debates, and athletic contests to which the public is admitted, but these are the only occasions on which both sexes come together. The centers are open from 7.30 o'clock to 10 every evening except Sundays and holidays throughout their season, which opens in October and lasts through April, and in a few centers to June. The average nightly attendance, which was 9545 in 1907, had increased to 20,085 in 1911.

The administration of the centers is in the hands of a specially trained corps selected from civil service lists and directed by a district superintendent of schools assigned to this particular task. Next to this official stand the inspectors, who begin with a salary of $1500, which in six years is automatically raised to $1750. The other grades with the respective salaries are as follows: —

RECREATION CENTER SALARIES

Principals	$4.00 per session
Teachers	2.50 per session
Assistant Teachers	1.75 per session
Junior Assistants	1.00 per session
Teachers of Swimming	2.00 per session
Librarians	2.50 per session
Pianists	2.00 per session

The maintenance of fifty-one centers in 1911 cost $84,506.91, which on the basis of the average nightly attendance made a per capita expense of $4.20.

Social Centers. — The third phase of the development thus far attained by the social center is best illustrated by the undertaking which was started in Rochester, N.Y., during the fall of 1907. To avoid any grounds for the suspicion of either philanthropic or aristocratic motives, the school selected for the first center was located in an obviously middle-class neighborhood. The assembly hall was equipped with gymnasium apparatus, the kindergarten was made available as a reading and quiet-games room; shower baths were installed and five hundred books were borrowed for library purposes. These privileges were opened to the women and girls on two nights of the week, to the men and boys three nights, while the remaining evening was devoted to a general entertainment in the auditorium, to which all classes were admitted. At the same time groups of men, women, and young people were organized as "civic" clubs. The men's club was open to all the adult males of the neighborhood and its weekly meetings in one of the larger classrooms were devoted to the discussion of both local and municipal questions, the main addresses being made by prominent persons from the outside. The topics considered by the women's club embraced both public and domestic problems, and besides their regular meetings they frequently entertained the men's club. On these occasions the women decorated the rooms, provided a program, and served refreshments, while the men footed the bills. Both organizations were also influential in securing playgrounds, free dental clinics, and similar community improvements. The "coming civic clubs" composed of young people from fourteen to twenty-one were supervised by members of the social center staff. Both the boys' and the girls' clubs held weekly meetings when business was transacted, debates were held or addresses by outsiders were delivered. The larger part of their efforts, however, were engaged by basket ball, calisthenics, amateur theatricals, and social affairs. Membership in all four organizations was open to all persons without distinction as to creed or political affiliations, and while it conferred the privilege of class instruction in the gymnasium, it was not requisite for the enjoyment of the library and games room. In the management of the weekly "general evenings" the men's and the women's club alternated and parts of the entertainment were frequently contributed by the younger organizations. The usual program consisted of congregational singing accompanied by the center orchestra, with an illustrated address, readings by an elocutionist, or a musical entertainment as the main and, usually, paid, feature. Social dancing, an athletic exhibition, or a period of conversational sociability brought the evening's enjoyment to a close. The staff at the first center and their salaries were as follows:

POSITION	EVENINGS PER WEEK	SALARY
Director	6[1]	$45
Director of women's and girls' clubs	3	25
Director of boys' clubs	3	25
Librarian and in charge of games room	5[1]	30
Director of men's "gym" work . .	3	25
Director of women's "gym" work . .	2	25
Pianist for women's "gym" work . .	2	15
Door and hall-keeper	6[1]	20
Night janitor	6[1]	50

[1] Sunday afternoon also.

The following year two other schools, one in a poorer and the other in a wealthier district than the first one selected, were also equipped as social centers and activities of the same general character were set in motion at each. Civic clubs were organized not only at the two new centers, but also in other schools until about half of all the public school buildings in the city had become the meeting places of these organizations. Two years after the formation of the first civic club there were sixteen clubs with 1500 members and the adult organizations had formed a "League of Civic Clubs," whose motto was "For the City as a Whole." Besides these there were several singing clubs, orchestras, fencing clubs, and a "spontaneous Art Club." Through the coöperation of local art societies and the center officials a loan exhibition of paintings and drawings was held, and the librarians at the three principal centers ran bureaus of information for persons seeking positions. In the civic club discussions matters of politics, religion, free textbooks, and those involving capital and labor were freely admitted, but an effort was made in all controverted questions to have both sides presented. The social center was not to take the place of any existing institution, but its central purpose was to develop, according to Edward J. Ward, who organized the Rochester system, "the community interest, the neighborly spirit, the democracy that we knew before we came to the city." The administration of the centers rested upon the Board of Education, and the original appropriation of $5000 with which they were established was obtained from the Common Council through the combined efforts of eleven local voluntary organizations of public-spirited people. The centers were closed in March, 1911, through the failure of funds, but they were opened again the following year, though in a modified form. Supervisors are now employed by the Board of Education only for the young people's club work. Adult clubs aspiring to use the schoolhouses are charged a fee unless their meeting comes upon a night when the schoolhouse is open for evening school or recreation center purposes, and few such clubs are now in existence.

In the sixteen social centers which have been established in the Chicago public schools "an attempt has been made to restrict the recreational activities to those that stimulate development of mind as well as body." In the selection of games "special care was taken to eliminate all features in which chance was a factor." These quotations illustrate the educational and ethical motives which set the standards in the reading rooms, gymnasiums, singing, dramatic, and orchestral groups that are found in these centers. They are open two nights a week, for the most part, and are administered by a special corps selected from the regular teaching staff, who are paid by the board of education and take their orders from the first assistant superintendent of schools. A number of volunteer social workers also assist. In Detroit social centers conducted in a similar manner are supported by the school board in four schools.

Those which are maintained in eleven Philadelphia schools by the Home and School League, the Civic Club, and allied organizations, offer, in addition to the usual program of folk dancing, calisthenics, games, singing, and club work, many varieties of handwork of such a character that they can be easily performed in the ordinary recitation room. The workers who are part paid and part volunteer are selected and directed by the volunteer societies, while the school board furnishes the light, heat, and janitor service. Following a survey of the city's recreational needs and facilities, a referendum was held in Milwaukee in the spring of 1912 which authorized its board of school directors to levy a two tenths of a mill tax for the support of social centers and other recreational work. This will yield about $88,000 annually, and the organization of this work under a superintendent and staff has already been accomplished. The school social centers of Columbus, Ohio, were inaugurated by the local School Extension Society, but are now carried on under a municipal department of public recreation. In Louisville, Ky., they were started by the Women's Club with the coöperation of the Men's Federation and the school board. A revival of the school center in Boston was brought about during the winter of 1911–1912 by the Women's Municipal League. Two skilled social workers were employed to conduct an intensive club work in the East Boston High School, and the undertaking has succeeded so well that it has been taken over by the Boston School Committee and similar opportunities will be afforded in other schools. In Jersey City the School Extension Committee obtained permission to hold weekly public dances in several schools, which met with such success that now they are supported by the school board, while the Committee still coöperates in the supervision of the dancing and the development of clubs among the young people who attend them. Along with its other recreational undertakings the Pittsburg Playground Association, a large part of whose funds are appropriated by the municipality, maintains centers during the winter in two public schools. These instances illustrate the principal factors in the initiation, administration, and support of this institution as it now exists. Its present extent in the United States is approximately shown by a survey covering the season of 1911–1912 which was made by the Russell Sage Foundation and which may be summarized as follows: forty-four cities reported centers at which there were paid workers; in nineteen of these the workers (in some only a part of them) are paid by the board of education; fifty-seven cities reported schoolhouses which were locally known as social or recreation centers, though they were conducted entirely by volunteer workers; in eighty-four of all the cities reporting centers the heat and light are furnished by the school board; in seventy-two the heat, light, and janitor service are provided by the board; in fifteen the board bears the total expense; total amount of money reported as expended in the maintenance of school centers, $139,535.73; total number of schools used in the 100 cities, 338.

While the social centers established up to the present time exhibit chiefly recreational, social, and cultural aspects, there are tendencies which indicate the future development of important civic attributes. The need of suitable places for political meetings which has been forced upon the public consciousness by the problem of campaign contributions has brought forth the suggestion that school buildings be used for that purpose, and, as has already been stated, they are now being so used in several large cities. If this movement grows, school boards will be obliged to provide the administrative machinery for regulating the holding of these meetings. Whether or not this task will fall upon the social center staff or upon the day-school officials remains to be seen. Mr. Ward, who is now promoting the civic center idea as a staff member of the University Extension Division of the University of Wisconsin, favors the designation of school principals as "civic secretaries" with power to effect the organization of citizens into deliberative bodies meeting in the neighborhood school. In a modified form this idea has already taken root in Duluth, Minn., where the Board of Public Welfare has been granted an appropriation for a civic secretary.

The Kentucky legislature has recently made it legal to permit the use of school buildings for "any lawful assembly of educational, religious, agricultural, political, civic, or social bodies," and effective measures are provided to insure that such privileges shall be granted when properly requested. The school laws of Oregon permit the use of schoolhouses "under careful restrictions, for any proper purpose, giving equal rights and privileges to all religious denominations or political parties." In Pennsylvania the new school code allows the board of school directors to permit the use of school grounds and buildings "for social, recreation, and other proper purposes," while the Massachusetts legislature has recently decreed that the temporary use of school buildings may be had "upon such terms and conditions and for such public or educational purposes as the said school committee may deem wise." The Wisconsin law provides that school directors in the larger cities are authorized to "establish and maintain for children and adult persons, in school buildings and on the school grounds, under the custody and management of such boards, evening schools, vacation schools, reading rooms, library stations, debating clubs, gymnasiums, public playgrounds, public baths, and similar activities." It is further provided that if the school board should refuse to proceed as authorized by the act, the question may be decided by a local referendum, and if a majority of the electors favor the proposition, then the board is obliged to undertake such activities as are legalized by the act and requested by the people. Legislation providing for similar extensions of schoolhouse privileges is also contemplated in other states.

Public Lectures.— The beginnings of a popular use of schoolhouses have been made in many cities through the holding of public lectures. Sometimes these are held under the auspices of the local teachers' association or a charitable society, and in these cases tickets of admission are sold for the purpose of raising funds. In many places the superintendents of schools arrange lectures upon professional subjects for the benefit of the teachers; in some instances the topics have a broader cultural value and the public at large is also invited. In other cities this function is performed by a committee of the board of education. An example is found in Cleveland, Ohio, where the committee on Social Center Development arranges each year a program of lectures and entertainments in some fifty-seven schools. All of the performers contribute their services and the work has the coöperation of the D.A.R., the local musical organizations, clergymen, professional men, and public-spirited citizens. Over a hundred programs are given annually to an aggregate attendance of 30,000 people. In New York City, where this work has had its largest development, there is a Department of Public Lectures whose head is coördinate with the superintendent of schools and reports directly to the board of education. This department originated through an act of the state legislature in 1888, by which the school board was "authorized and empowered to provide for the employment of competent lecturers to deliver lectures on the natural sciences and kindred subjects in the public schools . . . in the evenings, for the benefit of working men and working women." It was further enacted that no admission fee should be charged. In 1901 the wording of the enactment was amended so that the board was given power "to maintain free lectures and courses of instruction for the people of New York." In 1911 lectures were given to over 5000 audiences aggregating a total attendance of 987,346 people. These took place in 177 centers, the majority of which were public school buildings, at a per capita cost per lecture of eleven cents. Over 1800 different topics were treated in these discourses, most of them illustrated by stereopticon slides. A wide range of subjects was covered, including among others literature, history, social matters, fine arts, general and applied sciences, physiology and hygiene, descriptive geography and travel. Many of the lectures come in courses, and examinations are conducted for the benefit of those desiring to carry on systematic studies.

Parents' Meetings. — The use of schools by adults is also brought about by the meetings of

A Girls' Literary Club, Brooklyn.

A Neighborhood Dance, Jersey City.

A Singing Class, Chicago.

Metal Work, Jersey City.

Athletic Contest, New York City.

A "General Evening," Rochester, N Y

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parent-teacher associations (see PARENTS AND SCHOOLS) and the various entertainments and occasions provided in the course of their activity. Some notion of the extent of these organizations can be obtained from the fact that branches of the National Congress of Mothers with which most of them are affiliated exist in over thirty states. The many ward improvement associations which are meeting in schoolhouses to discuss better lighting or transportation facilities and similar matters germane to neighborhood life illustrate another phase of the movement that is making the public school more and more a center of community activities.

Rural Schools. — The socialization of the rural school is proceeding in much the same manner, though more slowly, through changes (*a*) in the curriculum and teaching methods, (*b*) in the undertakings of the teacher besides the regular teaching, and (*c*) in activities on the school premises outside of day-school sessions.

(*a*) The tendency to base the language work upon those facts of nature which are of immediate interest to the farmer and to introduce crop accounts into the arithmetical instruction are typical examples of the manner in which attempts are being made to give an agricultural content to the traditional formal curriculum of the country school. In certain localities of Virginia a survey is made of the existing and possible industries, and then training preparatory for carrying them on is introduced into the school program. In many of the colored schools of the South, especially, as well as white schools in other parts of the country, domestic science work is provided for girl pupils, while a number of states now make agriculture a required subject in the rural elementary course. The frequency with which the problem of correlating industrial and academic subjects is found upon country teachers' institute programs indicates the widespread character of this movement. The consolidation of schools which is now proceeding rapidly in various sections is also making possible a closer adaptation of rural schooling to the future needs of the pupils. The experimental farm, laboratories, assembly rooms, libraries, and playground apparatus which are practicable in the centralized schools will all help to make them the social and cultural, as well as educational, centers of their respective constituencies.

(*b*) The teachers trained in Hampton Institute are accustomed to organize and conduct clubs among their young people and to arrange meetings with the parents. By means of quilt contests, kitchen openings, and other occasions which bring the neighbors into the schoolhouses, they obtain apparatus for the schools and raise funds for improving school property. Schoolrooms are decorated, cement walks are laid about the schoolhouses, and the grounds beautified with hedges and flowers. Some of the funds are expended in water coolors and individual cups and better toilet arrangements. Through the efforts of these teachers about 200 improvement leagues have been opened in connection with the colored rural schools of Virginia. In the Henrico rural schools and those of other counties, frequent exhibitions are held of pupils' handiwork from both shop and kitchen, while patrons' meetings are a regular feature of the term program. The graduates of Tuskegee also are carrying on similar social work in the communities where they teach. In Georgia the Berry School, where scientific agriculture and housekeeping are taught in a most practical manner, has served as a model for eleven other schools which have been established in that state.

(*c*) The agricultural clubs which have an estimated membership of over 200,000 boys and girls are not only stimulating an improvement in crop-raising methods, but focusing the attention of their many communities upon the schoolhouse as an economic force and asset. There are not only hog and corn clubs for the boys, but also canning, tomato, and poultry clubs for the girls. Barley- and oat-growing tests are also carried out by some of these organizations. This movement is being stimulated by the United States Department of Agriculture, agricultural colleges, and county superintendents of schools. In Winnebago County, Illinois, a silo and alfalfa census which was taken in 1910 through the schools illustrates one of the various methods employed to relate education to the life of the community. The demonstration of Babcock milk testers and the running of germinating tests for seeds as practiced by rural teachers in many districts throughout the country exemplify some of the other ways in which the machinery of the rural school is being adapted to local needs. In Ohio, township boards of education are authorized to appropriate annually $250 from school funds for district school libraries; and, not only in this state but in others, bookcases with glass doors, tables spread with magazines, and racks containing agricultural bulletins form a regular part of the schoolroom equipment, and these facilities are patronized by the adults as well as by the young people of the community. Growing out of the agricultural clubs are exhibitions and festivals, which are held in the schoolhouses in the evening and on holidays. The principal of an agricultural high school in Maryland has organized clubs among the farmers and arranged courses of evening lectures for them upon technical agricultural subjects. For the women a series of monthly meetings are held on Saturday afternoons when the latest methods of housekeeping and various home crafts and the decoration of rooms are discussed and studied, while the cultural life of the community is stimulated by debates, spelling bees, and other literary exercises. The "Hesperia movement," which attracted attention some years ago, refers to the meetings and social occasions held under the auspices of the teacher-patrons' associations of western Michigan. In several Wisconsin counties, also, farmers' clubs have been organized by the county superintendent to meet in school buildings, while in others spelling contests are arranged which include social and literary features. In the southwest and the northwest, societies specifically called "social center" organizations are meeting in rural schools, the members of which often travel many miles to attend the evening functions. In these and other regions the country school is informally used for dancing parties or religious gatherings. The school-farm movement which has started in Wake County, North Carolina, involves the cultivation of from two to ten acres of land surrounding the schoolhouse and the sale of the crops for educational purposes; and since it brings about gatherings of the farmers in working bees, it is having a decided social effect upon the community. The Country Department of the Y.M.C.A. is furthering a solidarity of rural interests through the organization of athletic meets in which teams from various schools throughout the district compete for trophies and prizes. In Texas an active social center movement is being promoted by the proprietor of an agricultural publication, who not only devotes the columns of his journal to it, but in November, 1911, financed a social center conference that was attended by delegates from all sections of that country, and who is furthering, also, the spread of school libraries. Through the influence of such positive propaganda and the incidental effects of the other forces that are improving country life, the rural schoolhouse is being restored to that important rôle which the history of New England has attributed to the "little red schoolhouse."

Europe. — The social aspects of foreign public education relate chiefly to the school's primary function, the preparation of the young for adult life. On the pedagogical side, they embrace mainly the introduction and extension of manual training, domestic science, and vocational instruction of all sorts in day and continuation schools, and, on the physical side, gymnastics, medical school inspection, provision of meals, open-air schools, sex instruction, and special schools for defectives. (For more detailed information see the respective topics and the accounts of education in the various countries.) The close adaptation to a wide variety of vocational needs which is exhibited by the Fortbildungsschulen of Germany, especially in Munich, together with the civic and cultural motives behind the system, are especially noteworthy in this connection. Another institution showing distinct social motives in its origin is found in the folk high schools existing in Denmark and some of the other Scandinavian countries. The students' hotels or "scholars' homes" which form a part of the secondary school system of Switzerland have also a sociological interest. The public care of young children, which in several continental countries begins in babyhood through the provision of crêches, is continued in France by means of the *école maternelle* until the kindergarten age, and is further maintained during childhood by the *école de garde*, which looks after them during their play hours. At the upper end of the school-age period Germany is most tenacious, having a continuation system that compels the attendance, in some of its states, of all apprentices under eighteen years. The material attention to school children in France extends not only to the furnishing of their meals at the cantines, but, in the case of poor children, to assistance with clothes through the *caisse de écoles*, while mutual aid societies, affording pecuniary relief to needy scholars, are quite general. In British countries thrift is promoted by school banks, while the head masters frequently help their graduates in finding suitable employment; and in London and several other English cities there are after-care committees among the local authorities which follow the careers of pupils and extend assistance when necessary. In Denmark about one third of the town pupils spend their vacation seasons in the country, largely at holiday camps organized by the Elementary School Teachers' Association. "School journeys" and vacation excursions are promoted by school and voluntary agencies in England, France, Germany, and several other countries. Physical training, especially in central and northern Europe and in England, is unequivocally accepted as a responsibility of the public school, and gymnasiums and baths are very generally provided, while the conduct of calisthenics and swimming lessons are regular tasks of the teacher. Open games and athletic sports are also promoted in these countries as well as in Norway, Scotland, and Australia. In the last-named country, where large playgrounds customarily adjoin the schools, and in the famous private schools of England, field sports are recognized as distinct means of developing *esprit de corps* among the pupils, and the older boys are drilled as cadets and taught rifle shooting. School gardens are found in Australia, New South Wales, Canada, France, and several other European countries. School societies of one sort or another flourish more or less in all the leading systems, while the inculcation of patriotic ideals through the celebration of national holidays is quite general.

The activities which involve a utilization of the school plant outside of the regular instruction periods and which are most often initiated by some organization not connected with the educational system are more common in England, Scotland, and France than they are in the other European countries. In the British Isles these are usually of a recreative character, and the organizers are such voluntary societies as the Children's Happy Evenings association, Play Centers committees, Games guilds, Vacation schools, Boys' and Girls' brigades, Boy Scouts, etc. A canvass made in 1911 by the National League for Physical Education and Improvement showed that of the 324 education authorities in England and Wales, 24 gave general facilities for organized games, 26 granted permission to use premises, and 13 granted some financial aid. In 1904 Mrs. Humphry Ward organized an Evening Play Centers Committee to carry on in the London County Council schools a recreational program modeled upon that afforded in the Passmore Edwards Settlement. According to a report of the Committee: —

The centers are open five evenings a week, from 5.30 to 7.30, and on Saturday mornings, during forty weeks in the year, for boys and girls between the ages of five and fourteen. The children attached to each center are chosen, in the first instance, by the teachers of the four or five schools, as the case may be, within easy reach of the center, who are asked to make the *need* of the children their basis of choice. A child normally attends a center twice a week, but a third attendance is allowed for library or quiet games, and each center has a list of children who for reasons of special need are allowed to attend every night. The roll of a center is usually from 800 to 1000 children, and the average weekly attendance at a full center during the winter terms is about 2400. Each center is under the direction of a paid superintendent, who is responsible to the play centers committee, and is assisted by both paid and voluntary workers. The occupations include: musical drill, dancing, singing games, gymnastics, woodwork, cobbling, basket-work, painting, plasticine modeling, needlework, knitting, quiet games, and reading, while there is always a toy room for the little ones.

The London County Council lend the buildings and give free cleaning, caretaking, heating, and lighting. During the summer of 1911 the same committee carried on playground activities in twenty-six schools in various parts of London. In Paris choruses, meeting in public schools, are organized by singing teachers among former pupils, and there is also a vast amount of popular education which is voluntarily extended to the laboring classes by such associations as the Polytechnic, the Philotechnic, the *Union française de la jeunesse*, and similar organizations. Their lectures and study classes are held in the schoolhouses and are enjoyed annually by many thousands of people. In France, also, the school libraries are frequently open to parents as well as pupils. The schoolhouses of England are let for Sunday schools, political meetings, for use as polling places, and for other purposes in accordance with a regular scale of fees, and the income from this source during a year amounts in some cities to a considerable sum. While parents' meetings are held in the schools of Finland, New South Wales, England, and several other countries, the practice of arousing a popular interest in educational affairs by this method is not very general. In some German cities there are local committees of perhaps a score of prominent parents who are organized and take an active interest in school affairs; and here, as well as in England, representatives of trade guilds and manufacturing concerns are found upon the committees charged with the conduct of continuation schools: but nowhere in Europe is there the amount of popular participation in the administration and enjoyment of public educational facilities as is attained by individuals and associations in the United States. C. A. P.

See Athletics, Educational; Continuation Schools; Evening Schools; Excursions, School; Lecture System; Playgrounds; Parents and Schools; Vacation Schools.

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SCHOOL ASSOCIATIONS. — See Teachers' Voluntary Associations.

SCHOOL ATLAS. — See Maps.

SCHOOL BATHS. — See Baths.

SCHOOL BOARDS. — See City School Administration; County Boards of Education; District Boards of Trustees; State Boards of Education; Town Systems; Township Systems. See also the various state systems, and England, Education in.

SCHOOLBOOK COMMISSIONS. — See Textbook Commissions.

SCHOOLBOOKS. — See Textbooks.

SCHOOL BUILDINGS, EXTENDED USE OF. — See School as a Social Center.

SCHOOL CENSUS. — See Census, School.

SCHOOL CHILD, HYGIENE OF. — See Hygiene, School.

SCHOOL CITY. — See Self-government in Schools.

SCHOOL CLOSETS. — See Latrines.

SCHOOL COLORS. — See Student Life.

SCHOOL COMMISSIONER. — The term is used rather loosely in the United States, being applied both to members of school boards and to the chief executive officer of school systems. In Baltimore and Indianapolis, for example, the city board of control for the public school system is called a board of school commissioners, instead of the much more common term of board of education. In Maryland, also, the term county board of school commissioners is used for what is elsewhere termed county board of education. In Massachusetts and New York and in Porto Rico, also, the chief school officer of the state is designated as commissioner of education instead of the more usual term of superintendent of public instruction. In Ohio the chief state school officer is known as commissioner of common schools, and in Rhode Island as commissioner of public schools. The term is also applied to the chief educational officer of the United States, who is known as the United States commissioner of education. E. P. C.

See also Boards of Control; Commissioner of Education; School Boards; Superintendent of Schools.

SCHOOL COMMITTEE. — A term used very generally in the New England States for what is elsewhere known as board of education, board of school trustees, or board of school directors. The use of the term is historical, and dates back to the time when the board for school control was merely a committee on schools of the town board of selectmen (trustees, or council). E. P. C.

See District System; School Boards.

SCHOOL, CONTINUOUS. — See Session, Length of.

SCHOOL DAY. — See Period of Study.

SCHOOL DECORATION. — See Decoration.

SCHOOL DIRECTOR. — See Directors, School; District Boards of Trustees.

SCHOOL DISCIPLINE. — See School Management.

SCHOOL DISEASES. — See Contagious Diseases; Infectious Diseases; Medical Inspection.

SCHOOL DISTRICT. — A term applied to the smallest unit of school management. There are various forms of the district, as follows: —

(*a*) *The Common School District.* — A certain variable and usually irregular area, of varying size, the boundaries of which are formed and changed by authority to suit the convenience of the residents, and the people of which unite in the partial or complete support of a school or schools. It is next to the oldest unit of school organization in the United States and the smallest civil division recognized. Usually it is a small area, varying from one or two to ten or sixteen square miles, though in sparsely settled states a district is not infrequently of large area. The tendency has been to subdivide the district in order to bring the school nearer to the child. Frequently districts have not more than half a dozen families, and districts with but one family and even with but one child have had a legal existence. A district may be subdivided to form a new district; may part with a portion of its area to enable some resident to become a member of an adjoining district, so as to enable his children to attend a nearer school; and may have territory from other districts added to it for this or other purposes. A schoolhouse is located at some point in the district and a school is maintained. The local governing authority for rural school districts is commonly a board of three district trustees, or district school directors. (See District Boards of Trustees; District Meeting; and District System.)

The school district being the unit, the term is also applied to larger areas than the rural school district. It may be coincident with a town or township, as in Connecticut and Indiana. (See Town System; Township System.) A city with a large and complicated school system is in reality only a school district grown large, and in many states it is so regarded. (See City School Administration.) Hence a school district may be governed by a board of school trustees or school directors (usually three), as in rural districts; by a township trustee (Indiana), or trustees (Ohio); by a town school committee (New England); or by a city board of education.

(*b*) *Joint District.* — A term applied to a school district lying partly in two or more civil divisions, as in each of two townships, or two counties. The district is governed locally, just as a common school district, but it reports to and is governed by the township or county authorities of only one of the two or more civil divisions, usually the one in which the schoolhouse is located.

(*c*) *Union and High School Districts.* — A union of two or more districts for some educational purposes, such as a union of school districts with the transportation of pupils to a central school (see Consolidation of Schools), or a union of a number of common school districts to form a high school district, known as a union high school, the districts keeping their identity for elementary school purposes, and paying their quota for the support of the high school. Joint union high schools may likewise be formed by the union of districts lying in two or more counties. (See School Unions.)

(*d*) *Special or Independent Districts.* —These are districts organized under special laws, and are usually granted some special privilege. The most common of these are the special tax districts, formed, generally, in the southern states, where a town or city is allowed to organize as a special tax district, levy special local taxation, and enjoy certain special privileges. See articles on the state systems of Arkansas, Georgia, and Iowa, which contain examples of this form of district. In some cases, such special tax districts escape paying their proper share of any county school tax levied, and thus work injury to the rural and small town schools. The so-called independent school districts of Iowa are good examples of this, as are also the town and city school systems in a number of other states. E. P. C.

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SCHOOL ECONOMY. — See School Management.

SCHOOL EXCURSIONS. — See Excursions, School.

SCHOOL EXHIBITIONS. — See Exhibitions, School.

SCHOOL EXTENSION. — See School as a Social Center; University Extension.

SCHOOL FEES. — See Fees.

SCHOOL FESTIVALS. — See Festivals, School.

SCHOOL FUND COMMISSIONERS. — A state body, known by this or by some analogous title, is to be found in many of the Western states. Sometimes the board is known as a Board of School Fund Commissioners (Kansas), but more frequently as a State Board of Land Commissioners. Such boards have control of the sale of lands granted to the state by the national government (see National Government and Education) for all educational and other purposes, and of the investment of the funds accruing from the sale. Colorado, Kansas, Montana, Nebraska, North Dakota, Oklahoma, and Oregon are examples of states having such state boards. The governor, the secretary of state, the state treasurer or auditor, the attorney-general, and sometimes the state superintendent of schools form such boards, the number of members varying from three to five. In other states the state board of education is charged with the care of the school fund (Pennsylvania), or some state official, such as the surveyor-general, is charged with the preservation and sale of the lands, and the state treasurer (California), or the state comptroller (New York), is charged with the proper investment of the school funds. In Rhode Island there has been for a long time a single state official, known as the commissioner of the school fund, who has been charged with the care and the proper investment of the fund. E. P. C.

SCHOOL FUNDS. — There is no uniformity in the use of the terms "common school fund" and "school fund" in the United States. In some states these terms are used to designate permanent endowments, in others annual revenue derived from a variety of sources. In Indiana, New York, Oregon, and Washington Common School Fund is the official title of a permanent state endowment for common schools. Georgia uses the same term to designate the total public school revenue derived from fourteen different sources; Kansas, to designate the total annual revenue for common schools derived from all sources; Nebraska, the income from the state taxes, fines, forfeitures, and interest on permanent school funds; Ohio, the income derived from the school tax.

Common or Permanent School Fund Defined. — This article is concerned with none other than permanent common school funds, by which term is meant a fund, the principal of which the state constitution or laws provides shall be kept permanently invested, and whose income alone, therefore, can be devoted to the support of common schools. The title most widely used in the United States with reference to such funds is Permanent School Fund. Some fourteen states use exactly or approximately this title, whereas only four, mentioned above, employ Common School Fund. The principal may be held by the state or divided among and intrusted for care and preservation to the counties, towns, cities, and villages, as in Indiana and Missouri. This class of funds differs from permanent local funds in that they owe their origin to an act or grant which made provision for the entire state or territory or for the component units of the same, townships or counties, and did not originate in some act, grant, bequest, or gift for one or only a limited number of communities or institutions within the state. Many cities, townships, and schools do possess funds of this strictly local type.

Origin. — The beginnings of the establishment of endowment funds for schools are discussed under the caption ENDOWMENTS (*q.v.*). The grants of land made in colonial times were special or local. They did not represent a policy adopted for the entire commonwealth. The next step toward a system of general endowment of schools was the reservation by the colony of land for schools in towns yet to be settled. In 1726 Connecticut divided five townships into fifty-three parts; three parts of each town were reserved, one for the support of a school and two for the ministry. Between 1783 and 1785 Connecticut sold seven towns, divided the proceeds among the towns of the colony already settled, and provided that the proceeds be set apart by each town as a permanent school fund. From the proceeds of the sale of these town lands, consequently, two classes of permanent school funds arose: the first, the fund belonging to the colony, which was distributed among the towns of the colony; the second, belonging to the new towns, rising from reservations of school lands within the towns.

The Connecticut colonial policy was early copied after the formation of the Union by Georgia, New York, Massachusetts, and other states. In 1783 the governor of Georgia was empowered to grant each county of that state one thousand acres of vacant land for erecting free schools. New York, in 1786, provided that in the unappropriated lands of the state two lots, "a gospel and school lot" and a "state lot," should be reserved in each township; the first lot for the support of the Gospel and schools within the township. Massachusetts in 1788 provided that in the disposition of all towns thereafter one lot of 320 acres should be reserved for the support of common schools in the township.

Types of Funds. — In the evolution of permanent school funds in the United States, just traced, five types are evident: (1) Funds arising from private gifts and bequests; (2) funds arising from the reservation of lands by the town for the support of schools within the town; (3) funds arising from the proceeds of the sales of unsettled land for the benefit of already settled units of the commonwealth; (4) funds arising from grants of lands to particular towns by colonies; (5) funds arising from the sale of school lands by states, in towns yet to be settled, for the support of schools within the town. The permanent school funds in the United States originated from a further extension of the policy represented by the last type. It was only necessary for the states and the federal government, after the formation of the Union, to adopt this policy for unsettled lands which were later to be formed into states, to bring about the creation of state permanent common school funds.

Permanent school funds in the United States may be divided into two classes according to their orgin — state and federal. Federal funds have been derived, broadly speaking, from two classes of sources: (1) lands owned by the United States, reserved for schools when the territory was first surveyed and granted to the individual townships or to the state, when the state was admitted into the Union; (2) federal moneys, including loans, grants, and appropriations.

Before the close of the Revolution, confusion and bitter antagonism reigned as the result of the conflicting state and federal claims to Western lands. Congress appealed to the states to cede their claims, pledging itself, on Oct. 10, 1780, to dispose of the ceded territory for the common benefit of all states, in a manner and upon condition of sale regulated exclusively by congress, and to form the territory ceded into states to be admitted into the Union upon a footing equal in all respects with that of the original states.

New York gave up her claims on Mar. 1, 1781, and the other states followed her example. Virginia reserved for herself about 3,300,000 acres of land, known as the Virginia military reservation, for the benefit of her military troops. Connecticut made her first cession on Sept. 14, 1786, but reserved for herself an area of about 3,710,000 acres of land lying in the northeastern corner of Ohio, known as the Western Reserve.

Without waiting for Connecticut's cession of her claim, congress, by an ordinance passed in May, 1785, had provided for the survey and sale of its public domain in the West. Two years later, namely, in 1787, an ordinance was passed which reaffirmed the spirit of the ordinance of 1785, but made no specific reservation of lands for common schools; but in the contracts for the sale of Western lands made thereafter lot 16 of each township was set aside for schools and two townships in each territory or state for an institution of higher learning. In the act establishing the territorial government for Oregon in 1848 and for Minnesota in 1849, it was provided that sections numbered 16 and 36 of each township should be reserved for the use of schools, and since then all new states admitted, except Texas and West Virginia, have received the two sections, while Utah, Arizona, and New Mexico received four sections in each township for schools. Of all the federal lands which have been employed by states to establish permanent common school funds, the sixteenth and thirty-sixth sections have contributed most. However, no inconsiderable portion of these funds has been derived from federal grants of lands given to the states, in many instances, for a particular object other than schools, but under such conditions that it was possible for the states to devote the proceeds to education. Among such lands may be named salt lands, lands granted for internal improvement, swamp lands, military, and, in the case of Arkansas, two townships granted for a state university. The 5 per cent of the sales of public land fund has also been added to the school fund by many states, and the distribution of the surplus revenue by the federal government in 1837 has also been an added source. The details as to these different national grants for education are traced at length under NATIONAL GOVERNMENT AND EDUCATION, to which the reader is referred. See also the articles on the different state school systems, ALABAMA, ARIZONA, etc.

State Lands as Source of Permanent Common School Funds of State. — Though some of the eighteen states received no grants of lands from the federal government for common schools, every state and territory, with the exception of the District of Columbia and Alaska, has at some time possessed such a fund. The sources from which such funds have been derived fall naturally into two classes: state lands and state moneys. The Literature Fund created by New York in 1786 is the oldest permanent public school fund in the United States. Today New York combines the income of all her permanent funds, thus making no distinction between her Literature Fund and her Common School Fund. The original purpose of the fund was not, however, to aid common schools, but to aid academies and training departments for teachers in such academies. Pennsylvania in 1786 passed an act setting aside 60,000 acres of unappropriated land for the purpose of endowing public schools. It does not appear, however, that these lands were ever devoted to a permanent fund, as the Common School Fund of Pennsylvania seems to have been first actually established in 1831. Connecticut, therefore, has the distinction of having created, in 1795, the first permanent common school fund, known as the School Fund of Connecticut. It was shown in a preceding paragraph how Connecticut came to possess about 3,300,000 acres of land in Ohio. This land was sold for about $1,200,000, which sum the state set aside as the principal of a permanent fund, the income of which was to be forever devoted to the support of schools. New York, by an act of legislature, Apr. 2, 1805, provided that the net proceeds of 500,000 acres of state lands should be appropriated as a permanent fund for the support of common schools. Georgia, by acts in 1817 and 1818, New Jersey in 1817, reserved state lands for the same purpose. The permanent school funds of Maine and Massachusetts were both derived from lands lying in Maine, at one time all owned by Massachusetts.

State Moneys as a Source of Common School Funds. — The moneys and sources of moneys which the states have devoted to their permanent common school funds include the proceeds of licenses, escheats, confiscations, fines, forfeitures, taxes on banks, direct taxes, appropriations, gifts, lotteries, slave moneys, moneys for exemption from military service, funds previously established, toll rates, sales of lumber, grass and mineral products on lands, etc.

States possessing Permanent School Funds. — The District of Columbia and Alaska have never possessed a general permanent common school fund, nor reservations either of land or of money with which to establish such funds. Pennsylvania and Georgia formerly had permanent common school funds, but to-day possess none, except that in Pennsylvania a new state school fund has recently (1911) been created. Georgia devotes state revenues derived from railroads and land rents and from certain bank stocks to the support of common schools. The remaining states and territories all possess one or more permanent endowment funds for common schools, or an account which is a recognition of the state's permanent indebtedness to such a fund, the principal of which has been expended, diverted, or lost.

The permanent common school funds differ greatly in value in the different states. Texas possesses two. In 1905 the combined principal of these two funds amounted to $52,660,489. Minnesota's fund, next in size, in the same year amounted to nearly eighteen million dollars ($17,824,135). The two states having the smallest permanent common school funds are New Hampshire and South Carolina. The principal of the former's fund amounted to $59,470 in 1905; the latter's in 1906 to about $16,000.

School Lands. — The inequality of the funds in different states is due to a large extent to the difference in the value and area of the school land reserved in the state. As has been shown, eighteen states received no grants of federal lands for common schools, twelve received one section in each township, or approximately one thirty-sixth of their entire territory for this purpose, fifteen received two sections, or one eighteenth of their entire area, and three received four townships, or one ninth of their area. In some states the lands were disposed of almost immediately after the state was admitted into the Union; other states still possess thousands of unsold acres of school lands. As the sections reserved were selected according to an arbitrary scheme of survey, without reference to the value or absence of value in some states, a considerable portion of the school land lay in desolate regions, whereas in other states they were situated in extremely valuable land. It is impossible at the present time to secure a satisfactory estimate of the value of unsold common school lands. The estimates given are in many cases based on surface area, and do not include the value of such products as minerals, oils, etc. In Minnesota in 1904 the unsold school lands on this surface area basis were estimated as worth $5,354,088.47. Since this time an effort has been made to determine the value of the ore and timber on these lands, with the result that the prospective value of the permanent school fund of Minnesota was in 1908 estimated at $125,000,000. At the present time acreage or surface value is the only basis that can be secured from all states, a basis which, it must be clear from these facts, is thoroughly unsatisfactory, not to say misleading.

Intact Funds and Credit Funds. — In many states the principal of the permanent common school funds and moneys which should have been added to such principal have been invested so carelessly, squandered, diverted, wasted, and embezzled so shamefully that what ought to be to-day a magnificent endowment, with an income affording an appreciable relief from taxation, has dwindled to an almost negligible sum or exists as a permanent state debt on which interest is paid out of taxes levied on the present generation. The causes of loss have been many, among which may be named the selling of lands below value, the lax terms of sale, failure to record deeds of sale, losses through bad loans, unpaid notes and interest, embezzlement, losses through the Civil War, and losses due to the fact that moneys devoted by law to the fund are not added to it. As the result of these facts and conditions, funds fall naturally into two classes: intact funds and credit funds. Intact funds represent a real productive investment. Connecticut, Massachusetts, Maryland, Oregon, South Dakota, Utah, and Wyoming, are among the states which appear to have kept their funds intact.

There are three classes of credit funds: (1) Class one includes funds the principal of which has been lost or diverted outright, but which is recognized by the state as a permanent debt, on which the state must pay annual interest at the legal rate. The funds of Tennessee, Kentucky, and the greater portion of that of Louisiana are examples of this class. (2) Class two is found in states whose laws provide that the state may expend moneys belonging to the principal as fast as they are covered into the treasury, credit the amount to the fund, and pay interest on the permanent state account for common schools thus established. Maine, Michigan, and Ohio have pursued this policy. (3) Class three includes funds which, though not theoretically, yet are in part practically credit funds, whose moneys have been borrowed by the state, which indebtedness is represented by state bonds that will in all probability never be redeemed, and which consequently constitute what is practically a permanent state debt. The fund of California is in part a credit fund of this third class. In federal and state reports all three classes of funds are reported from year to year without comment, so that many states are frequently supposed to have permanent productive endowments for common schools which in reality have nothing but paper funds, accounts or debts which serve no other purpose than to be an additional source of taxation.

Importance of the Funds. — Owing to this failure on the part of federal and state reports to distinguish between permanent credit funds and intact permanent funds, the statistics given in such reports are misleading. The *Report* of the United States Commissioner of Education for 1908 (p. 28) states that $4\frac{8}{10}$ per cent (.048) of the total receipts for common schools in the United States was derived from the income of permanent funds and rents. From what has already been said it will be seen that a very considerable portion of this amount was derived from taxes levied to pay the interest on the credit funds. The comparatively small percentage of the whole revenue for the support of common schools, derived from the permanent common school funds and land rents, is in danger of causing a misconception of their real present importance. Several states derive a large part of their school moneys from state endowments. Wyoming in 1906 derived $49\frac{3}{10}$ per cent of her common school moneys from this source; Nevada, $47\frac{6}{10}$ per cent. Texas in 1905 derived $29\frac{2}{10}$ per cent; in the same year Utah and Oklahoma, over 20 per cent. Seven states, Oregon, North Dakota, Indiana, South Dakota, Nebraska, Delaware, Idaho, and Missouri, between 10 and 14 per cent. All other states derived less than 10 per cent, ranging all the way from $9\frac{3}{10}$ per cent, Kansas, 1902, to $\frac{16}{100}$ of 1 per cent, South Carolina, 1906.

Management of Permanent Common School Funds. — The question, whether the permanent common school fund was owned and should be managed by the state or by smaller units, *e.g.* townships and counties, was easily settled in such states as Connecticut, New York, and Massachusetts, where the fund was created by act of legislature. But in states where the fund arose from the proceeds of the sales of township lands, the question arose whether the state had any right to supervise or control the management of the fund. The funds of this origin earliest established were regarded as belonging to the townships and managed by the townships or by the state or county for the townships. However, a tendency to regard the state as the lawful owner and manager soon appeared, and every state since the admission of Michigan in 1837 has devoted its township lands to a public permanent state-controlled fund. At least six states continue to maintain these funds as township funds: Ohio, Indiana, Illinois, Alabama, Louisiana, and Missouri. Connecticut, since 1810, has employed a commissioner of the school fund, an officer whose sole duty is the management and care of the fund. Had the other states followed the example of Connecticut, millions of dollars would have been saved. In many states the management of the permanent common school funds is intrusted to a single officer, such as the treasurer or controller. In others it is managed by a state board of commissioners, in some by the state board of education.

It would be difficult to estimate the importance of the part which these funds have played in bringing into existence state systems of free schools in America. They set those systems in motion and kept them going. Prior to 1870 the policy of supporting free schools was considered a debatable question. Conditions existed quite universally in the United States in the earlier part of the nineteenth century, and continued in many states long after the middle of that century, which are difficult to describe and more difficult for the present generation to realize. Schools were rare, school buildings wretched and foul, the teachers untrained and ignorant, their wages small and uncertain. Some communities maintained no free schools, others supported free schools for a brief period. Taxation for schools, permissive in many states, compulsory in a few, frequently could not be levied owing to the hostile attitude of the public. There was almost no state supervision, and efforts to collect the most meager data proved futile. In the South and in a considerable portion of the East, free schools were looked upon as charity schools. State appropriations for free schools were frequently not applied for; in other cases the money was used for the support of private schools. Through the establishment of permanent common school funds, public sentiment has been educated, and the free school raised from a position of scorn and contempt to one of pride and social recognition.

Influence and Effects. — These permanent funds were the first stable source of support of free schools in America. They did not, it is true, make the schools of their respective states free from the beginning in every case, but they supported those schools through periods of indifference and hostility. Through their influence the custom of depending on "rate bills," *i.e.* pupils' tuition fees, and other uncertain sources for the support of schools and the payment of teachers, was done away with. The influence of the permanent public common school funds has been turned directly upon certain portions of the school system through enacting provisions respecting objects to which the income of the funds might lawfully be applied, and also provisions regarding the conditions and methods of apportionment. The Connecticut school law of 1799 made teachers' wages and board the sole lawful objects of application of the income of the school fund. The failure of Connecticut to name any conditions which school districts must meet resulted in lowering educational standards. Local taxation rapidly fell off and the school fund of Connecticut was pointed to as a warning. The other states were wise enough to see that the evils in Connecticut were not due to the existence of the fund, but rather to the manner of distributing its revenue. New York in 1812, three years prior to the first distribution of the income of her common school funds, enacted that a town must raise by taxation a sum equal to its share of the revenue, in order to participate in the same. Many other states adopted the plan of New York, and a permanent school fund in such states consequently became a lever for compelling communities to raise local taxes for the support of schools. F. H. S.

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SCHOOL FURNITURE. — See Desks and Seats, School.

SCHOOL GARDENS. — See Gardens, School.

SCHOOL GOVERNMENT. — See School Management.

SCHOOL GROUNDS. — See Architecture.

SCHOOL, HIGH. — See High School.

SCHOOL HOLIDAYS. — See Holidays, School.

SCHOOLHOUSE. — See Architecture, School.

SCHOOL HYGIENE. — See Hygiene, School; Hygiene of Instruction; and articles on Architecture, School, etc.

SCHOOL HYGIENE, INTERNATIONAL CONGRESS ON. — International congresses on school hygiene were held in Nuremberg in 1904, in London in 1907, in Paris in 1910; and the *Proceedings* are large and important collections of papers. The fourth international congress is to be held in Buffalo, U.S.A., August 25–30, 1913. The President for this congress is Charles W. Eliot, President Emeritus of Harvard University, and the secretary-general, Dr. Thomas A. Storey, College of the City of New York. W. H. B.

SCHOOL HYGIENE ASSOCIATION, THE AMERICAN. — This association, devoted to the scientific study and spread of information in regard to school hygiene, was organized in Washington in 1907. It holds annual meetings and publishes its proceedings. The permanent secretary is Dr. Thomas A. Storey, College of the City of New York.

W. H. B.

SCHOOL INQUIRY COMMISSION. — See Parliamentary Education Commissions.

SCHOOL, INTERMEDIATE. — See Intermediate Grades.

SCHOOL JOURNALS. — See Journals, Educational.

SCHOOL JOURNEYS. — See Excursions, School.

SCHOOL LIBRARIES. — See Libraries.

SCHOOL LIGHTING. — See Lighting of Schoolrooms.

SCHOOL LUNCHES. — See Lunches.

SCHOOL MANAGEMENT. — **The Field of School Management.** — The term "management" has come to be applied to a specific problem of educational administration; namely, the conduct of the classroom. It is a problem primarily of the individual teacher, and consequently the terms "class management" or "classroom management" indicate rather more definitely the field that it attempts to cover. In view of the fact that it deals largely with routine procedures and aims to prevent waste by organizing routine upon an effective basis, the term "school economy" has been used by some writers as an expressive equivalent.

School management, as a body of educational doctrine, comprises a number of principles and precepts relating primarily to the technique of classroom procedure, and derived largely from the practice of successful teachers. The writers in the field have interpreted these principles and precepts in various ways, usually by reference to larger and more fundamental principles of psychology, sociology, and ethics. Attempts have been made to derive practical suggestions for management *a priori* from these more general principles, but the basic sciences are still so far from adequate that this may generally be regarded as an unsafe method of attacking the problem. Where current successful practices are inconsistent with so-called principles, it is well to examine the principle carefully to determine its validity. Waste, confusion, and educational disaster have sometimes resulted from a failure to "make haste slowly" in working out the practical implications of plausible hypotheses which are misinterpreted so frequently as immutable laws.

Mass Education. — Most of the problems of management and practically all of the difficult problems arise from the fact that the school must deal, not with individuals as such, but with groups. How to secure the most effective conditions for the education of the group becomes then the central problem of management. Hence the importance that attaches in the doctrine of management to such topics as order and discipline, the daily program, the routine of moving classes, and the technique of study periods, blackboard work, constructive exercises, etc. Hence also the central position of the factor of habit; for the formation of effective habits in connection with the specific details of school work is the obvious method of systematizing routine and preventing waste. Mechanized routine, however, exists not for its own sake but to the end that the work for which the school exists may not be unnecessarily interfered with. Consequently, while habit is a central factor in school management, attention shares this central position; habit is the means, attention the end. Habits must take care of the mechanical details in order that attention may be devoted to those experiences which are more broadly educative. Throughout the entire discussion of management, the basic problem is to determine what organization of the mechanics of school work will best promote effective attention upon the part of the mass of pupils to the truly educative activities.

School management, however, differs from what is now known as "scientific management" in the business world in a very important particular. It touches the child intimately during a very impressionable period of life. The means which it employs to attain its end are in themselves factors in the general education of the child. In fact, some of the most important outcomes of formal education are universally admitted to be the habits and ideals that come directly from the life of the school rather than from the subjects of the school curriculum which represent, in a much more abstract form, the crystallized experience of the race. The school experiences of the child should furnish, and in most cases undoubtedly do furnish, fundamental lessons in the art of living and working amicably and helpfully with one's fellow men. Recent theories of education explicitly recognize the importance of this factor, and by implication give to school management a significance that should do much to inspire teachers to a systematic study of the principles underlying the art.

Mechanizing Routine. — One of the first questions that the teacher must ask himself on taking charge of a classroom is this: What details of organization should be reduced as speedily as possible to the plane of unvarying habit? The answer to this question will vary with the size of the class and the age of the pupils. Large masses must obviously be more rigidly organized than small groups, if the essential activities of school life are to go on with a minimum of distraction. Older pupils can and should consider and respect the rights of others without depending upon specific rules, but the younger pupils have yet to acquire the necessary measure of self-control. In general, the following points may be considered in this connection: —

The Passing of Lines. — In all large elementary schools it is commonly necessary to organize a line formation for admitting pupils and for dismissing them. While this is not primarily the duty of the classroom teacher, the responsibility for his own pupils in line formation usually rests upon him. The aim must be to admit and dismiss pupils as expeditiously as is consistent with good order and a perfect control of the moving lines by those in authority. Quiet and order are especially important where pupils of different rooms of the same building are dismissed at different hours, either for recess or for the close of the session. It is well to insist from the outset that, whether pupils move in lines or without line formation, they should walk through the corridors and up and down the stairs. Where hundreds of children are congregated in a single building, too much care cannot be exercised to guard against anything that would unnecessarily increase excitement or prevent adequate control in the event of an incipient panic.

Disposing of Wraps. — In all schools this must be taken care of by a carefully considered system. Wherever possible, lines should be passed through the cloakroom in both entering and leaving the classroom, each pupil depositing his wraps in an assigned place. Where the cloakroom has but one exit, it is better to have the wraps collected by monitors after the pupils have entered the room, and distributed at dismissal.

Movements in the Classroom. — The passing of pupils to the blackboard or to the construction tables is likely to cause confusion unless organized upon a routine basis. The same is true of necessary movements involved in taking books and materials from desks. Some initial attention on the part of the teacher to matters so seemingly trivial as these will pay rich dividends in the aggregate of moments saved and confusion avoided. So small a detail as the packing of books and other materials in a uniform order in the desks will be well worth while.

Insuring Hygienic Conditions. — (1) Posture. So much of the time spent by the child in school requires of him the sitting posture that steps must be taken at the very outset to initiate correct and healthful habits in this regard. The proper structure of seats and desks is discussed in another section (see Desks and Seats, School), but even with the best desks and seats, there will be need for attention from the teacher in securing correct sitting posture. Where adjustable furniture is not provided, especial care should be taken that the pupils' feet rest squarely upon the floor, that the desk is not so high as to require a raising of the shoulder when the writing position is assumed, and that the desk overlaps the seat by a "minus distance." The most pernicious posture is that in which the pupil slides forward in the seat, supporting the body by the end of the spinal column and the shoulders, throwing the head far forward, and compressing the chest. The correct writing posture is, of course, particularly important. Specific demonstration of the correct postures should be given by the teacher, and the pupils required to assume one or another of these postures until adequate habits are formed. The program should be arranged so that the various exercises of the school day will permit a frequent change of posture. The correct standing postures may also be profitably demonstrated at the outset and appropriate habits developed. (2) Ventilation and temperature. Whatever steps need to be taken to insure an adequate supply of fresh air should be reduced to routine as speedily as possible. Unwholesome air will often accumulate so gradually as to escape detection, if one depends upon sense stimuli alone. Either the teacher or monitors appointed for the purpose must form the habit of attending to the conditions of ventilation at periodic intervals. The same rule holds in respect of temperature, especially where temperature is not automatically governed by a thermostat. (See Air of the Schoolroom; Heating; Ventilation.) (3) Cleanliness and neatness of the classroom. The formation of habits that will prevent unnecessary untidiness in the classroom should be mentioned in this connection. The sharpening of pencils, the filling of inkwells, and the disposition of waste paper are the matters that should be looked after systematically by responsible monitors. Pupils should understand that muddy shoes are to be cleaned before coming into the corridors or classrooms; mats, scrapers, brushes, and blacking should be provided for this purpose. In modern school buildings, ample lavatory facilities are available, and cleanliness of the person may be demanded. In any case, washbasins, hygienic devices for soaping, and paper towels should be provided in all schools. (4) The bodily functions. In rooms that are in charge of young and inexperienced teachers the privilege of "leaving the room" is especially likely to be abused. The encouragement of regular habits among the pupils with regard to the bodily functions is of prime importance. If recesses are provided during morning and afternoon sessions, it is a good practice in the elementary school to pass all lines through the latrines before the pupils go to the playground. In many modern schools, the practice of providing two large closets in the basement or in outbuildings has given place to the construction of closets on each floor and sometimes in connection with each classroom. Where this plan has been adopted, many of the evils associated with the basement or outhouse closets are eliminated. At the same time, other evils are likely to be multiplied. In any case, the closet arrangement should permit the frequent and careful inspection of closets by some responsible officer of the school during school hours. (5) Moral health. This suggests the importance of providing by suitable routine against various other dangers that must always be considered when large masses of children are congregated within a small space. It may be too much to say that the teacher should know what his pupils are doing at every moment of the time during which he is responsible for them, but this should at least be the ideal toward which he should work. The supervision of recesses is a most important function of the classroom teacher unless the principal assumes this function alone. The likelihood is, however, that a part of the responsibility must be delegated to the classroom teacher. The janitors who are competent to be trusted with this important duty are very seldom to be found. In this connection, the danger of permitting pupils to congregate in the toilet rooms, in the corridors, or in segregated parts of the school grounds merits attention. While these groups may be engaged in quite innocent conversation, it is well for those in authority to be absolutely certain that mischief is not brewing and especially that the mental filth which finds so ready a lodgment in the minds of children is not spreading its corruption. There is no royal road to health in this connection. The teacher must ever be on the alert, not in a prying or spying way, but openly and with a full realization of a most significant responsibility.

The task of mechanizing routine is simple in principle but difficult in practice. The gravest danger lies, perhaps, in making the routine too prominent in the eyes of both teacher and pupils. While, as has been pointed out, it may be looked upon as more than a means to the single end of schoolroom order, while the habits and prejudices that it engenders should be of large importance in the out-of-school life of the pupils, it is well for both teacher and pupils to look upon the necessary routine as particularly directed toward making the other activities of the classroom possible and profitable. Here, as elsewhere in the work of teaching, the attitude is all-important. If the pupils are unduly repressed and worried because of constant attention to the matters above discussed, every purpose of management is likely to be defeated. The very end that we seek is *mechanized* routine, — routine that is automatic in its operation. Wherever practicable, therefore, the pupils should be led to understand and appreciate the economy that effective habits will promote. Discussion with the pupils in the intermediate and grammar grades regarding the types of activity that may profitably be reduced to a mechanical basis should help in securing the attitude of coöperation upon which real success depends.

The opening day of the school is none too soon to initiate the necessary habits. The pupils are generally well disposed, and the teacher will have a good opportunity for breaking down their shyness and self-consciousness by the brief discussions recommended above. Too much, however, should not be attempted, and time should remain on the first day for some thoroughgoing class work. It is practicable and wise, however, to explain the more essential movements, and give a little practice in each. If this is done in the right way, the school will quickly settle into the desired routine.

Once these activities have been started, they should be insisted upon good-temperedly but firmly until they have become "second nature." Many teachers fail because they make the wrong start; others start aright, but fail to sustain themselves. While initial focalization is the first law of effective habit building, the prevention of exceptions is the most difficult law to live up to.

The Daily Program. — Although closely related to the topic of routine, the problem of the daily program is so important and involves the consideration of so many subordinate problems that it deserves separate treatment. The characteristics of an effective time-table vary with the various grades and ages of pupils and with the type of school, but the following features are fairly constant: (*a*) The time-table should provide explicitly and systematically for instruction in all of the subjects that are required by the course of study; (*b*) it should preserve an equitable balance in proportion of time allotted between the "constants" and the "variables" of the curriculum, between subjects intrinsically easy and subjects intrinsically difficult, and between subjects the chief function of which is to leave with the pupils effective habits, subjects that are to result in information or knowledge, and subjects that are inspirational in their nature; (*c*) it should recognize the factor of fatigue, the necessity for effective variety in tasks assigned, and the necessity for periods of play, relaxation, and recuperation; (*d*) it should be constructed, as far as possible, in harmony with the findings of experimental education; (*e*) it must recognize the practical necessity of dealing with pupils in groups, and the consequent necessity of providing adequately for independent work by the pupils.

The Apportionment of Time among Various Subjects. — At present there are very few adequately determined standards with reference to this problem. In most of the city systems the total available time is divided more or less arbitrarily among the different school activities, and the classroom teacher is expected to construct the daily time-table upon the basis of this apportionment. These schedules vary widely, although there are some undisputed points of uniformity. A very careful experimental investigation of this whole problem is badly needed. Pending the conclusions of such an investigation (and it would necessarily extend over several years), some one of the arbitrary standards should be selected as a tentative guide. The following prescriptions now in force in two typical city systems may be of interest in this connection. Newark is fairly representative of the cities that emphasize the "content" subjects; Cleveland of the cities that emphasize the "form" subjects; neither, however, represents the most radical tendencies in either direction. (The numerals in the first eight columns indicate the number of minutes allotted each week to the various subjects.)

CLEVELAND, OHIO

GRADE	I	II	III	IV	V	VI	VII	VIII	PER CENT TOTAL TIME
Opening exercises	50	50	50	25	25	25	25	25	—
Reading	500	500	440	310	255	215	240	240	24.77
Spelling	75	100	125	100	80	75	75	75	6.46
Grammar	—	—	—	—	—	—	160	160	2.93
Language, composition	125	150	125	165	190	190	40	40	9.40
Writing	75	100	100	100	90	75	75	50	6.10
Arithmetic	60	215	225	240	225	245	225	250	15.45
History	—	—	30	40	—	80	135	135	4.22
Geography	—	—	45	160	200	200	90	90	7.20
Music	75	85	85	85	80	80	80	80	5.96
Drawing	75	75	75	75	90	90	90	90	6.05
Manual training	50	50	50	50	60	60	100	100	4.77
Physiology-hygiene	15	15	15	30	30	30	30	30	1.65
Physical training	100	85	60	60	60	60	60	60	5.00
Recess		75	75	75	75	75	75	75	—

NEWARK, NEW JERSEY

GRADE	I	II	III	IV	V	VI	VII	VIII	PER CENT TOTAL TIME
Opening exercises	75	75	75	75	75	75	75	75	—
Reading (inc. lit.)	600	480	430	290	280	170	150	150	22.37
Spelling	75	75	75	75	75	75	75	75	5.26
Grammar	—	—	—	—	60	60	60	60	2.10
Language, composition	150	150	150	150	100	100	100	120	8.95
Writing	60[1]	60	60	60	60	60	40	—	3.50
Mathematics	100[2]	240	240	240	240	240	240	300	16.14
Hist. and Civics	—	—	—	30	30	150	150	200	4.91
Geography	—	—	—	150	150	150	150	—	5.26
El. Science (inc. physiology and hygiene)	30	30	30	30	30	30	30	60	2.36
Music	60	60	60	60	60	60	60	60	4.21
Drawing	60	60	60	60	60	60	60	60	4.21
Manual training	60	60	60	60	60	60	90	90	4.73
Physical training	60	60	60	60	60	60	60	60	4.21
Unassigned	45	25	35	35	35	25	35	65	2.63
Recess	75	75	75	75	75	75	75	75	—

[1] No formal instruction in Grade I.
[2] First half year no number work; optional second half year.

The above proportions may be profitably contrasted with the "ideal" allotment computed by B. R. Payne (*Public Elementary School Curricula*, New York, 1905, pp. 197 ff.): —

	Per Cent of Total Time
English (including reading, spelling, writing, grammar, literature, and oral and written composition)	27.5[1]
Arithmetic	12.5
Geography	7.5
History and Civics	7.5
Nature Study	7.5
Drawing	5.0
Music	5.0
Physical training	7.0
Handwork	10.0
Opening exercises	10.0

[1] The corresponding proportion (including all language subjects) is 42.18 for Newark and 49.66 for Cleveland.

The general question of the relative importance of different subjects of the elementary school curriculum is too intricate and involved to be discussed here. It is sufficient to say that public school standards have been undergoing a process of transformation in America during the last two decades, and that many subjects are now recognized as "constants" in the curriculum which were not admitted at all twenty years ago. There can be little doubt, however, that the elementary school must always lay its chief emphasis upon the arts that are fundamental to social life. These are obviously the language arts, the arts of computation, and the arts of conventional behavior. The position of manual training, drawing, nature study, and music is already fairly secure, but the functions of these subjects have not as yet been clearly formulated. Of the instructional subjects, — the subjects that are to result primarily in facts and principles, rather than in specific habits, — geography, national history, and the principles of hygiene have an easily demonstrated right to first consideration. In general the following specific subjects may be tentatively assumed as integral and constant features in every American elementary school curriculum: (*a*) reading (including the mechanics of reading and some acquaintance with English literature), spelling, writing, oral and written composition; (*b*) the essential processes of arithmetic; (*c*) national history (including civics), geography, and the principles of hygiene. From the theoretical point of view, training in moral habits and in etiquette should be added to this list, but the prevailing tendency is not to recognize these explicitly in the stated program, but rather to insist upon their constant emphasis through the school life of the pupil. The supplementary subjects ("accessories" or "variables") are nature study, drawing, music, manual training, domestic arts, and physical training. The two last-named subjects, at least, are obviously of fundamental importance, but their status in the typical elementary curriculum has not been sufficiently standardized to permit their inclusion among the constants at the present time.

In constructing the daily time-table, the first task of the teacher is to provide adequately for the constant or fundamental subjects. These should be allotted the periods of the day that are most favorable for the type of work involved. The unit of division is the recitation period, — the period during which the class meets with the teacher for discussion, recitation, drill, or examination. Definite maxima have been generally adopted in American schools for the recitation period in the various grades. These are known as Chadwick's standards and are as follows: Grade I, 15 minutes; Grades II, III, and IV, 20 minutes; Grades V and VI, 25 minutes; Grades VII, VIII, and IX, 30 minutes. These standards represent, of course, the maximal time to be given over to recitation, — not the total time to be devoted during each session or during each day to each subject, nor the briefest time during which any stated exercise may extend. Sometimes, indeed, it will be wise to shorten periods and multiply the number of times that a certain type of exercise is given during the day. This is particularly true of periods that are devoted to rapid drills. These should as a rule be not more than ten minutes in duration.

Provision for Independent Work. — Where two or more classes or groups occupy a single room and are in charge of one teacher, provision must be made for alternation of independent work (study periods) and class work (recitation periods). The daily time-table should indicate clearly the type of independent work that is customarily assigned for each study period. Certain subjects do not require this independent preparation; in so far as practicable, class exercises in these subjects should embody all of the pupils in the room. In the eighth grade, and perhaps in some cases in the sixth and seventh grades, one or two subjects may be prepared through assignments for home study. In general, study periods may, in two-class rooms, be allotted the same amount of time given to class work in the same subjects. Up to the sixth grade, the independent work in a subject should preferably either immediately follow or immediately precede the class exercise in that subject. Care should be exercised that independent work normally involving the writing posture (such as preparation of arithmetic lessons) should not immediately follow or succeed formal drills in writing or drawing or other work requiring the writing adjustment.

The Disposition of the Different Subjects in the Daily Program: the Factor of Fatigue. — It may be assumed that the periods of the school day that are most favorable for mental work should, so far as possible, be devoted to those subjects in which mental application demands the greatest amount of energy. There are two problems, then, to consider: (1) at what periods is energy most readily available for mental application, and (2) what subjects are normally or intrinsically most fatiguing. There are wide differences of opinion among authorities upon both of these questions, and doubtless wide individual differences among pupils. Much patient experimentation is needed to lay an adequate factual basis for safe generalization. Pending the results of such investigations, however, tentative hypotheses for the guidance of present practice must be drawn from the most trustworthy available data. With regard to the favorable periods, it may be assumed that the morning hours are, for most pupils, somewhat better than the afternoon hours, and that the middle and later parts of each session are more favorable than the earlier parts. In so far as the relative fatiguing influence of various subjects is concerned, the following table may be tentatively accepted. It represents a "composite" of the tables constructed by different investigators in the field of fatigue. The most fatiguing subjects are given an arbitrary fatigue value of 100; the numerals following the other subjects represent approximately their relation to those most fatiguing. (See FATIGUE.)

Formal gymnastics (unaccompanied by music)	100
Mathematics	100
Foreign languages	90
Formal study of mother tongue (including formal composition, spelling, writing, grammar)	90
History	85
Geography	80
Nature study	80
Drawing	60
Singing	40

After the constant or fundamental subjects have been disposed of, the remaining time may be divided among the accessory subjects. It is often possible to arrange for these in such a way that the work demanded may provide a healthful variety of exercises for the pupils. It is also both possible and profitable to emphasize numerous points of "correlation" between different types of school work. Thus drawing and manual training may frequently be linked together, and both should afford opportunity for correlation with arithmetic.

Typical Daily Programs. — The teacher who attempts to construct an ideal daily program is face to face with an impossible task unless he is responsible only for a single "grade," undivided into sections or groups. This mode of school organization is to be found in some localities, especially in the larger cities; but even here the present tendency is to divide grades and "rooms" into two or more groups; hence the necessary complication of the program and the consequent impracticability of making it consistent with all of the principles above laid down. As a matter of fact, desirable as it would be to have every exercise at the most favorable period of the day and to give to each subject precisely the proportion of time that its importance, difficulty, and fatiguing power suggest, it is vastly more important to organize the work of the school in such a way that the larger groups may be split up and ample opportunity and incentive for independent work provided. Program making, therefore, instead of becoming simpler with the congregation of large numbers of pupils in single buildings, still retains many of the difficulties that confronted the teacher in organizing the work of the ungraded, one-room school.

The following programs have reference only to rooms in which two or more classes are organized. They have been selected from various sources and represent typical present practices in the United States. The briefest inspection of them will reveal the fact that each one is inconsistent at some point or points with the principles laid down above. Such inconsistencies are, however, unavoidable in a program for a schoolroom with more than a single class or group.

FROM THE INDIANAPOLIS SCHOOLS (1910). FIRST-GRADE PROGRAM (THREE GROUPS IN ROOM)

PERIOD	DURATION (MINUTES)	EXERCISE
8:45–8:55	10	Opening exercises
8:55–9:10	15	Reading (Group 3 — beginners)
9:10–9:25	15	Reading (Group 2)
9:25–9:40	15	Reading (Group 1)
9:40–9:50	10	Physical exercises
9:50–10:05	15	Reading (Group 3) [1]
10:05–10:15	10	Writing (all groups)
10:15–10:35	20	Recess
10:35–10:50	15	Reading (Group 2) [1]
10:50–11:05	15	Reading (Group 1) [1]
11:05–11:15	10	Written or oral spelling (Group 3)
11:15–11:35	20	Drawing (all groups)
11:35–11:45	10	Music (all groups)
1:15–1:20	5	Opening exercises
1:20–1:35	15	Reading (Group 1)
1:35–1:50	15	Reading (Group 3)
1:50–2:05	15	Reading (Group 2)
2:05–2:20	15	Singing, marching, or games — recess
2:20–2:35	15	Reading and writing (Group 1)
2:35–2:45	10	Reading and writing (Group 3)
2:45–3:00	15	Reading (Group 2)

[1] Formal work in arithmetic is not undertaken in Indianapolis during the first school year. Where "number work" is required, it could be placed at the points indicated.

A THIRD-GRADE PROGRAM FROM THE INDIANAPOLIS SCHOOLS (TWO GROUPS IN THE CLASSROOM — FIRST HALF YEAR AND SECOND HALF YEAR)

PERIOD	DURATION	EXERCISE
8:45–8:55	10	Opening exercises
8:55–9:10	15	Language ("A" class)
9:10–9:25	15	Language ("B" class)
9:25–9:40	15	Arithmetic ("A" class)
9:40–9:50	10	Physical exercises (both classes)
9:50–10:05	15	Geography ("B" class)
10:05–10:20	15	Penmanship (both classes)
10:20–10:35	15	Recess (both classes)
10:35–10:55	20	Arithmetic ("B" class)
10:55–11:15	20	Reading ("A" class)
11:15–11:30	15	Geography ("B" class)
11:30–11:50	20	Reading ("B" class)
11:50–12:00	10	Music
1:30–1:50	20	Reading ("A" class)
1:50–2:10	20	Reading ("B" class)
2:10–2:20	10	Spelling (both classes)
2:20–2:30	10	Recess (both classes)
2:30–2:55	25	Drawing (both classes)
2:55–3:00	5	Singing (both classes)

A FIFTH-GRADE PROGRAM (TWO CLASSES IN ROOM)

Adapted from Bagley, *Classroom Management* (New York, 1907), p. 63.
(Exercises italicized are for the reciting class.)

Period	Duration	"A" Class	"B" Class
9:00– 9:10	10	Opening exercises	
9:10– 9:20	10	Spelling	
9:20– 9:30	10	*Spelling*	
9:30– 9:55	25	*Reading*	Arithmetic
9:55–10:15	20	Arithmetic	*Arithmetic*
10:15–10:30	15	*Penmanship*	
10:30–10:45	15	Recess	
10:45–11:10	25	*Arithmetic*	Reading
11:10–11:30	20	Geography	*Reading*
11:30–11:50	20	*Geography*	Geography
11:50–12:00	10	Physical exercise or singing	
1:15– 1:40	25	Language	*Geography*
1:40– 2:00	20	*Language*	Language
2:00– 2:20	20	History or Physiology	*Language*
2:20– 2:30	10	Music	
2:30– 2:45	15	Recess	
2:45– 3:10	25	*History or Physiology*	History or Physiology
3:10– 3:30	20	Reading	*History or Physiology*
3:30– 3:50	20	*Drawing or Nature study or Handwork*	
3:50– 4:00	10	Unassigned	

AN EIGHTH-GRADE PROGRAM (TWO CLASSES IN ROOM

Adapted from Bagley, *Classroom Management*, p. 67.
(Exercises italicized are for the reciting class.)

Period	Duration	"A" Class	"B" Class
9:00– 9:10	10	Opening exercises	
9:10– 9:20	10	*Spelling* [1]	*Spelling* [1]
9:20– 9:50	30	*Arithmetic* [1]	Arithmetic
9:50–10:20	30	Grammar	*Arithmetic*
10:20–10:30	10	*Penmanship*	
10:30–10:45	15	Recess	
10:45–11:15	30	*Grammar*	Grammar
11:15–11:40	25	Physiology or Civics	*Grammar*
11:40–12:00	20	*Drawing, Nature study, or Agriculture*	
1:15– 1:45	30	History	*History*
1:45– 2:15	30	*History*	Physiology or Civics
2:15– 2:30	15	Music	
2:30– 2:45	15	Recess	
2:45– 3:10	25	*Physiology* [2] *or Civics* [2]	Literature
3:10– 3:35	25	Literature[2]	*Physiology* or *Civics* [2]
3:35– 4:00	25	*Literature* [2]	*Literature* [2]

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[1] The preparations for these recitations may involve either "home study" or the "study recitation" in school. (Colgove, however, wold not permit home study of arithmetic; cf. *The Teacher and the School*, p. 182.)

[2] Manual training and domestic science may be provided for by alternation in these periods.

A PROGRAM FOR A RURAL OR UNGRADED SCHOOL (FIVE DIVISIONS IN THE ROOM)

Reprinted by permission from C. P. Colgrove, *The Teacher and the School* (New York, 1911), p. 186.

Time	Duration	1st Primary	2d Primary	1st Intermediate	2d Intermediate	Advanced
9:00– 9:10	10	*Opening Exercises*				
9:10– 9:20	10	*Reading*	Reading	Reading	Arithmetic	Arithmetic
9:20– 9:30	10	Copying	*Reading*	Reading	Arithmetic	Arithmetic
9:30– 9:45	15	Copying	Written work	*Reading*	Arithmetic	Arithmetic
9:45–10:00	15	Blackboard work	Written work	Arithmetic	*Arithmetic*	Arithmetic
10:00–10:15	15	Reading	Drawing	Arithmetic	Drawing	*Arithmetic*
10:15–10:30	15	Reading	Number work	*Arithmetic*	Reading	Written work
10:30–10:45		Recess				
10:45–10:55	10	*Reading*	Number work	Arithmetic	Reading	History
10:55–11:05	10	Written work	*Numbers*	Reading	Reading	Reading
11:05–11:15	10	Written work	Reading	Reading	*Reading*	Reading
11:15–11:25	10	Handwork	Reading	Nature study	Physiology	*Reading*
11:25–11:35	10	Handwork	*Reading*	Nature study	Geography	Geography
11:35–11:45	10	Number work	Language work	*Nature study*	Geography	Geography
11:45–12:00	15	*Writing and Drawing*				
1:00– 1:10	10	*Numbers*	Handwork	Language	Geography	Geography
1:10– 1:20	10	Number work	Handwork	Language	Geography	*Geography*
1:20– 1:30	10	Drawing	Reading	Language	*Geography*	Grammar
1:30– 1:40	10	Reading	Reading	*Language*	Grammar	Grammar
1:40– 1:50	10	Reading	*Reading*	Composition work	Grammar	Grammar
1:50– 2:00	10	*Reading*	Nature work	Composition work	Grammar	Grammar
2:00– 2:10	10	Nature study	Nature study		Grammar	*Grammar*
2:10– 2:20	10	Nature study	Drawing	Spelling	*Grammar*	
2:20– 2:30	10	*Music*				
2:30– 2:45	15	Recess				
2:45– 2:55	10	*Nature study*	*Nature study*	Spelling	Physiology	History
2:55– 3:05	10	Copying	Blackboard work	*Spelling*	Physiology	History
3:05– 3:15	10	Blackboard work	*Spelling*		*Physiology*	History
3:15– 3:30	15	Language	Drawing	Library work	Spelling	*History*
3:30– 3:40	10	*General lessons*	*General lessons*	*General lessons*	Spelling	Spelling
3:40– 3:50	10	Reading	Reading	Arithmetic	*Spelling*	Spelling
3:50– 4:00	10	Reading	Reading	Arithmetic	Arithmetic	*Spelling*

Absence and Tardiness. — The school habits of regular and prompt attendance are important for two reasons: In the first place, irregular attendance and frequent tardiness disturb the work of the school and the progress of the pupils as a group; consequently unnecessary delinquencies invade the rights of the majority. In the second place, irregularity of attendance is thoroughly inconsistent with the principles upon which modern society, with its highly organized system of industrial coöperation, is based; consequently the school that fails to instill effective habits in these two fields misses an opportunity for impressing a lesson that can easily be generalized and carried over by the pupil into the activities of later life.

There is ample justification, therefore, for the construction that is coming to be placed upon the compulsory attendance laws, namely, that these laws compel attendance on each day during which the school is in session, unless the pupil is detained at home by his own illness or by a very serious misfortune in the family. (See ATTENDANCE, COMPULSORY.) In many communities the efficiency of school work is sadly impeded by the failure of parents to take the "business" attitude toward the work of education. Children are kept out of school for trivial reasons, and the written-excuse system, which is practically universal in the United States, is notoriously inadequate as a means of insuring justice. Even where the compulsory attendance is enforced with a reasonable measure of rigidity, there is abundant need for the classroom teacher to consider methods and devices for encouraging regular and prompt attendance.

Two dangers, however, are to be noted in this connection. In the first place, the pupil may, under an unwise system of encouraging attendance, come to regard regularity and punctuality as privileges that he is conferring upon the school rather than as duties which the school may expect from him. The difference in attitude here is fundamental, slight as it may appear to the layman; for the unfortunate attitude has not infrequently been engendered in certain ultra-modern schools, and with disastrous results. The second danger lies in the overzealous endeavor of a principal or teacher to insure a commendable attendance record at any cost. Extreme measures are likely in many cases to impel pupils to attend school when they are physically unfit to do so.

Unfortunately no generally accepted attendance standards have been worked out for the various grades and types of schools. Not only is the teacher handicapped by this lack of definite criteria for determining the efficiency of his efforts to secure regularity and punctuality of attendance, but the situation is still further complicated because of practices in computing the per cent of attendance that are really deceptive. In many schools, this per cent is determined upon the basis of the average number "belonging." This would not be so unfortunate, were there uniform standards for computing the number of pupils "belonging" to the school. In some schools, pupils are dropped from the rolls after three days' consecutive absence and readmitted upon their return. During the period elapsing between the dropping and the readmission, these pupils do not form part of the school's enrollment, and consequently their absence does not affect the attendance record. In other schools, the pupils are retained on the rolls for five consecutive days and then dropped. In either case, it is clear that the attendance record may appear to be fairly good, while in reality the number of absentees is unusually large. The most practicable way to compute the per cent of attendance is upon the basis of the actual enrollment, deducting only pupils who have removed from the district or who have reached the end of the compulsory education age and have left school permanently. The pupils leaving to enter private and parochial schools should be noted separately. Notations should also indicate general causes for unusual absence. In this way the per cent of attendance will be a fair index of the school's efficiency in securing regularity of attendance. (See RECORDS AND REPORTS; ATTENDANCE.)

For the average city or town school it should be possible to maintain a record of from 94 to 98 per cent of attendance without undue pressure. Where this record is not maintained the classroom teacher should look carefully into the causes for the lax attendance. The best teachers are careful to keep informed regarding absent pupils, — not in an obtrusive fashion but as a matter of legitimate personal interest in their pupils. Calling at the homes after school hours or inquiring of brothers, sisters, or neighbors' children will convince the parents that the children are missed from school and stimulate them to do their part in preventing unnecessary absence. A policy of this sort, administered good temperedly, will help, even in schools that are supplied with regularly constituted attendance officers. There are, indeed, indications that the attendance officer will come to be looked upon less as a police official and more as a friendly adviser and counselor.

The control of tardiness is often more difficult than the control of absence. In both cases, the interest that pupils may come to take in the work of the school may be an important factor in insuring a good record and the school efficiency that depends upon regularity and punctuality; but it is the verdict of experience that this factor must operate upon the basis of an attitude that will tend to bring the pupils to school regularly and punctually because the school is there and duty issues the command. This point of view must be insisted upon or educational disaster is almost inevitable. In the average town or city school, tardiness can be reduced to a minimum of from one to two cases each month for each one hundred pupils. Some schools do even better than this. Habitual tardiness is usually due either to carelessness on the part of parents or to an inadequate judgment of time-intervals on the part of the young child. For the former deficiency, if a courteous explanation of the reasons for demanding promptness is unavailing, the authority of the law should be invoked through an interpretation of the attendance rulings which is thoroughly justified in view of the evil effects of habitual tardiness upon the class as a whole. Where the pupil alone is at fault, coöperation with the parents should be the first measure; this failing, some form of punishment that will associate delinquency with undesirable results is certainly not only justified but demanded for the sake both of the child and of the school.

Order and Discipline. — The fundamental necessity of dealing with individuals in groups or masses carries with it by implication the necessity for the maintenance of order. It is at this point that most of the difficulties in the management of the elementary school are concentrated. The practical experience of schoolmen testifies to the fact that more teachers fail through inability to maintain order than through any other one cause. Ruediger and Strayer in their statistical study of the qualities of merit in elementary teachers (*Journal of Educational Psychology*, Vol. I, pp. 272 ff.) show that disciplinary ability is the most important condition of success among the teachers who were included in the investigation. A. C. Boyce in a similar study of high-school teachers finds that, while disciplinary ability does not occupy the first place among qualities of merit, as in the case of elementary teachers, it still remains a factor of fundamental significance.

Certain conditions that now prevail in American education combine with certain social crises to make the problem of school discipline unusually acute. The tendency during the past two decades has been strongly and persistently toward leniency and latitude in those phases of school conduct that were formerly treated rigorously. There has been a pronounced reaction against the repression of individual impulse. The " pin-drop " type of order is now thoroughly taboo in our better schools. Parallel with this development has gone a radical reform in the administration of punishments and penalties and an increasingly insistent demand that the teacher shall secure the ends of good order by positive rather than by negative measures.

There are several factors which have coöperated to produce this reaction. The general tendency in society at large toward a more adequate recognition of the individual has been one factor. Far more important than this, in America at least, has been the unprecedented increase in wealth and the consequent inevitable loosening of the bonds of individual restraint. This condition has quite transformed the attitude of the people toward rigor in the administration of law, and has naturally been reflected in the current philosophy of school government. Finally, and as the prime immediate cause, stands the almost complete feminization of the teaching force in the elementary and secondary schools, thus delegating the immediate control of pupils to the sex whose tendencies may be looked upon as almost instinctively toward government by appeal rather than toward government by command. A correlative and coöperating factor has been the extreme youth of the teaching body and the readily recognized danger of placing in the hands of immature teachers a large measure of arbitrary authority. Coffman (*The Social Composition of the Teaching Population*, New York, 1911) demonstrates a high degree of probability that more than 50 per cent of the elementary school teachers in American schools are under the age of twenty-four.

The situation with regard to school discipline could be looked upon with less concern were it not for the social crisis that is impending in the United States with reference to the lack of respect for law, order, and authority. The disconcerting and probably unprecedented increase in crimes against the person and against property in the last twenty years, the growth of juvenile crime and " hoodlumism " in our large cities where " soft pedagogy " has taken its strongest hold, the weakening of the moral fiber as revealed in the increase of divorce throughout the country and in the general prevalence of corruption in state and municipal administration, — these unmistakable symptoms indicate clearly a social condition that no student of constructive educational policies can afford to neglect. The general extension of the *laissez-faire* doctrine of school government may or may not be functionally related to the phenomena just noted; this extension has, however, paralleled at every point the loosening tendencies in the body politic; and this concomitance strongly suggests something akin to cause and effect, — especially when one remembers that both the general decadence of the respect for law and order and the parallel changes in school government are very largely limited to this country. Foerster, it is true, has warned the Germans against an analogous danger on the Continent, but, grave as the situation may be in Germany and especially in France, it is far from indicating so serious a crisis as impends to-day in the United States.

The Function of Order and Discipline in Education. — As suggested in a preceding section, every measure that school management utilizes must be judged with reference to two possible outcomes: first, its efficiency in securing the immediately desired result, namely, a favorable condition of the operation of other educative forces; and, secondly, its influence as an educative force in itself, leaving with the individual pupil specific habits, working principles, ideals, or attitudes that may be carried over into his later life and become an important factor in determining his conduct. The measures that the school takes to promote what we term good order are of fundamental significance from both points of view. It is through these specifically that the measure of repression which is absolutely essential to effective school work is to be attained, and it is through these indirectly that the basic lessons of self-control, a respect for the rights and feelings of others, the proper attitude toward law and authority and toward work and effort may be indelibly impressed.

The complication of the problem by the operation of the latter factor makes effective discipline extremely difficult. It would be a comparatively simple matter to organize the school upon a military basis; in this way the superficial and external conditions of order and decorum could be adequately fulfilled, but, as has so often been asserted, the more important outcomes which should emanate from discipline as an educative force might easily be missed.

What are the factors that must be considered with reference to these more important outcomes? The problem here involves the troublesome necessity of insuring the transfer of training from the school situation to the situations of "real" life. According to contemporary theory, this transfer is probable under two conditions: first, the presence of identical elements in the two situations; secondly, the command by the individual of a method of procedure that has been abstracted from the matrix of details constituting the first situation and transferred through a process of judgment to other situations, the chances of such transfer being obviously favored by the positive emotional appeal which the method in question may make to the individual, — hence the term "ideal" of procedure. (See FORMAL DISCIPLINE.)

Applying this principle to the problem at issue, it may be concluded that school discipline will be operated to insure efficiency of conduct in later life (1) if the school life is organized upon the plan that characterizes social life in general; and (2) if the virtues represented by the discipline of the school, — obedience to constituted authority, respect for the rights of others, promptness, industry, and duty, — are idealized in the minds of pupils and become, in essence, prejudices or emotionalized standards of conduct.

Recent reforms in school organization have worked particularly toward the realization of the first condition. They have attempted to make the life of the school correspond much more closely to the life of society than was formerly the case. In the main, this movement has been productive of good results, although in many instances it has quite overshot the mark; for social life can never give the free play to individual impulse and initiative that some educational reformers have assumed. Its very essence is a compromise between individual desire and the common good. The reform movement has also neglected a very important change that has taken place in social, and especially in industrial, life. The highly complicated organization of industry which characterizes present-day civilization has in effect brought social life into a very close resemblance to school life. The school virtues of obedience, silence, promptness, regularity, and unremitting industry assume a very real significance when thousands of men are working together in a mammoth factory, or upon a highly organized railroad system, or in a specialized department of governmental service. The "common elements" in the school situation and the situations of "real" life are increasing far more rapidly than the differences. And this is natural, for both the school and modern industry deal with individuals not as such, but *en masse*.

In respect of the second condition, the idealization of the school virtues that will make for their transfer even when the situations have few superficial resemblances, one can say but little. Light is needed as to the factors that operate in the construction of effective ideals and attitudes. It is safe to assume, however, that the desirable virtues must be woven into the very fabric of the school life, if they are to become effective ideals. The ability to make the necessary abstractions, — to raise the virtues to the conceptual plane, — undoubtedly increases with age. One cannot expect very much from explicit moralizing in the lower grades, but with the older pupils an attempt should certainly be made to reveal the absolute necessity of the types of conduct that are demanded. To this end it is, of course, important that requirements should be justified by their necessity to the general efficiency of school work. At the same time it should not be an impossible task to teach adolescents the need for unyielding standards, for living up to rules that are necessary in the majority of social adjustments, even if their necessity is not apparent in this or that particular instance. To permit exceptions to occur in the application of standards is to open the paths of least resistance, and the individual himself is usually the last person who should decide whether a lapse is justified by the common good.

A Recognition of the Authority of the Teacher *the First Condition of Effective School Government.* — This recognition is a function of at least three factors, each of which may operate independently of the others: (*a*) The personality of the teacher is obviously of first importance. The attitude of the teacher toward his work and his feeling of responsibility for the government of his pupils are those elements in the generally unanalyzed complex called "personality" that are usually at fault when disciplinary troubles become serious. Given this feeling of responsibility for adequate results and for the good order that is both a condition of such results and an ingredient in them, and the teacher can scarcely escape an effective personal interest in and sympathy with his young charges. Without this seriousness of purpose and this interest and sympathy, the authority which law and public sentiment may delegate to the teacher is quite as likely to work evil as to work good; without the authority, however, and the recognition of the authority by parents and children, the responsibility becomes a word without a meaning and the sympathy and interest are shorn of half their power. Given both the requisite authority and the requisite sympathy, interest, and feeling of responsibility, success in discipline depends, from the point of view of the teacher's personality, upon (1) studious patience, (2) courage, (3) tact (especially in dealing with hypersensitive pupils and with parents), and (4) thoroughgoing self-control. To these may be added, as explaining by their lack the failure of many teachers, a good voice, a good governing "eye," and what may be (rather vaguely) termed a sense of order. It is obvious that most of these factors are amenable to development through the discipline of experience, and this probably explains why so many teachers who either fail or succeed but indifferently at the outset become thoroughly expert in the course of time.

(*b*) A second factor in the effective recognition of the teacher's authority is involved in the traditions of the school. It is sufficient to say in this connection that a school which has been started wrong or in which general disorder has been permitted to prevail may offer almost insuperable difficulties to the success of the young teacher. The principal of the school is usually the responsible agent in a situation of this sort.

(*c*) The third factor is represented by the attitude of the community toward the work and government of the school. It is a much simpler task for the German teacher to secure from public-school pupils a maximum of effort than it is for the American teacher. The attitude of the pupils is more uniformly favorable to obedience, favorable to putting forth effort in the direction that the teacher suggests. Where this attitude is not taken for granted, the difficulty of the teacher's task becomes immeasurably increased. It is, therefore, a fundamental principle of school management that the teacher be given sufficient power to insure, other things being favorable, an adequate attitude upon the part of the pupils toward his authority. In communities where public opinion is unfavorable to this attitude the position of the teacher often becomes intolerable.

Penalties and Rewards. — Every system of government which effectively establishes and maintains its authority must provide penalties for those individuals who fail to recognize this authority. Prisons, reformatories, and the machinery of criminal law are essential to the protection of the majority and the maintenance of the common good. Every form of coöperative society demands the repression by the individual of impulses which, "natural" though they may be, are inconsistent with social welfare and social progress. School government is no exception to this rule.

In the early development of formal education the chief penalty employed was corporal punishment in one form or another. Within the past half century the rod of correction has been used with decreasing frequency, and the present tendency in American education is to banish it entirely. It is generally agreed that the movement away from corporal punishment has been beneficial. Whether it has swung too far is still an open question. The rod is the symbol of a type of school management which was characterized by a rigorous insistence upon standards and by the belief that the immature child could not be depended upon to judge wisely as to the course that he should pursue. In other words, it recognized the principle of *compulsion* as opposed to the principle of individual initiative. The reaction which has swept aside the rod as the specific symbol of this doctrine has tended to carry with it the doctrine itself. And this, in the writer's opinion, is where the present difficulty and the impending danger are concentrated. (See PUNISHMENT, CORPORAL.)

The reaction against corporal punishment has been paralleled by the development of agencies which have, in some measure, fulfilled the function that the rod fulfilled in the old-time schools. In some communities, elaborate systems of monitorial service have been developed, such service being regarded by the pupil as a privilege and thus lending itself readily to employment as a reward either for orderly behavior or for meritorious effort. Detaining pupils after school hours and depriving them of recesses are representative penalties through which the ends of good order and faithful work are attempted. Devices innumerable have been suggested to give to the teacher an effective control over the conduct of the children for which he is responsible. Spencer's theory of "natural punishments" has been repeatedly urged as a basis for school management in spite of its fallacies. (*Cf.* a discussion of this theory in Colgrove, *The Teacher and the School*, New York, 1911, pp. 387 ff., and in the writer's *Classroom Management*, New York, 1907, pp. 106 ff.) The doctrine of "substitution" has been proposed to take the place of the older doctrine of "repression," upon the theory that, if healthful channels for the expenditure of the child's excess energy be provided in sufficient number, the undesirable expressions will not be forthcoming. Finally, as a natural consequence of the emphasis upon self-activity and individual initiative, some schools have gone to the extreme of *laissez-faire* and have made every form of repression taboo, thereby reducing the school life to a condition that, in a few cases, must be condemned as nothing short of anarchy. (See PUNISHMENTS AND REWARDS.)

In general, it may be said that in America the employment of penalties in school management has been restricted and discouraged. Detaining the pupil after school hours and depriving him of recesses are both generally looked upon as bad practice. "Scoldings" and rebukes are also frowned upon, and in the main the policy here is a wise one. The use of school tasks as penalties (the writing of words or the working of arithmetical problems in large numbers simply as a punishment) is obviously poor practice because it places the pupil in the wrong attitude toward school work. On the positive side, also, the granting of material prizes for good order or for good work is condemned. For stimulating the pupil to effort and for insuring his orderly behavior, therefore, the teacher must, according to current accepted standards, depend very largely upon his personal appeal and upon the general attitude of the community toward the work of the school. The latter factor, as has been pointed out, does not operate so uniformly in his favor as could be desired, and, in general, it may be concluded that he must depend primarily upon the personal element, if he is to do his work conformably with accepted standards of management.

It is obvious, however, that the standards, while representing ideal conditions, are quite inconsistent with a satisfactory solution of the situation which the average teacher confronts. The natural result is evasion, more or less unpremeditated, perhaps almost unconscious, but none the less disastrous. A recognition of the extent of this evasion, if the facts could only be known, would doubtless awaken the public to the utterly impracticable situation which confronts the teacher in those schools that are extreme in their insistence upon nonrepressive disciplinary measures.

The first and most important precept for the teacher to bear in mind in solving problems of discipline is to deal with individuals and to recognize individual needs in every corrective measure that is applied. It is because of the failure to recognize this principle that many of the disciplinary measures undertaken by young teachers work so disastrously. They attempt to punish the group for the shortcomings of the individual; they scold and threaten the entire class instead of singling out the offenders and treating them individually.

But individual treatment means something more than a general method of procedure applied to a single individual. It means selecting the type of treatment that will be best adapted to the case in question. Some pupils will be effectively corrected by the simplest sort of reminder; others will need a sharp rebuke; still others will be won by the evidences of the teacher's sympathy with and interest in them; some can be best turned from a wrong course by enlisting the coöperation of the parents; a few there will still remain that must be forced into submission by the mere preponderance of physical strength. It is fatal not to recognize these types and carefully to study each individual to determine the most effective method of dealing with him in each instance.

A second condition of effective discipline is the feeling upon the part of the teacher that he is secure in his authority, that his position will be supported by all of the power which the state can command, if this is needed to support him. It is in this consciousness of power that effective courage lies. To surrender to the whims of pupils, to let them have the consciousness of having conquered, is fatal. It defeats the two ends for which disciplinary measures exist, for it means anarchy in the classroom and it means a distorted perspective upon the part of the child toward the great problem of living amicably and helpfully with his fellows. When reasonable rules for the welfare of the mass can be overridden at will by the immature pupil in the schools, the seeds of that lawlessness which now forms so serious a social problem in this country are being scattered broadcast.

This suggests a third condition, persistence in the problem of discipline until it has been satisfactorily solved. The teacher must come to take toward the serious cases of discipline the same attitude of studious patience that the physician takes toward a serious case of illness. Refractory pupils are just as inevitable as refractory diseases, and it is entirely within the realm of possibility that our school system will sooner or later develop its staff of consulting experts to advise with classroom teachers regarding the best methods of solving these troublesome problems.

The relations between the school and the home are often important factors in disciplinary management. In systems that have narrowly limited the power of the classroom teacher, an attempt has been made to hold the parent responsible for the misdemeanors of children, and to secure a proper respect for the authority of the teacher through the medium of parental authority. (Cf. J. S. Taylor, *Class Management*, New York, 1908, p. 70.) While the coöperation of home and school should be encouraged here as elsewhere, it is questionable whether the teacher should surrender the principle implied in the phrase *in loco parentis*. The future efficiency of the teaching profession may be at stake here. Responsibility without commensurate authority is a word without a meaning, and where one's authority becomes hedged about by impracticable restrictions it soon comes to be, in effect, a dead letter. (See Family Education; Parents and Schools; Schools as a Social Center.)

We have already referred to the grave danger of evasion by the teacher of impracticable rulings that limit his authority. Another danger, perhaps equally serious, should be noted. It is easy to follow the lines of least resistance in discipline, to fail to note and correct lapses from reasonable requirements because of the tedious procedure that one must take in order to act consistently with unreasonable restrictive rulings. Thus young teachers are likely to permit such lapses to continue until incipient disorder and disrespect for authority have become chronic. It is this condition which renders quite ineffective certain doctrines of school management that appeal to the layman as thoroughly practicable.

When so many of the teachers in our public schools are young girls, themselves just out of school, with their native feminine tendencies toward leniency intensified by the long years during which they themselves have been pupils and students, and confirmed by the sentimental attitude which the instruction given in teachers' institutes so often encourages, the chances are that a good many children will be "spoiled" (in the domestic sense of this term). The danger to society which this condition involves is clearly apparent; and against this danger a doctrine of school management that is to be effective must sedulously guard, even if it seems to overemphasize certain factors that were characteristic of the older type of school government.

Pupil Self-government. — Numerous attempts have been made to solve some of the troublesome problems of school discipline by developing self-governing organizations among the pupils. These experiments have been suggested by the excellent results which have followed from delegating a measurable degree of initiative and responsibility for school government to the older pupils in the English secondary (boarding) schools, and also by the unquestioned success of "self-governing" institutions for waifs, of which the George Junior Republic at Freeville, N.Y. (*q.v.*), is the most conspicuous example. The experiments in public elementary and secondary schools in the United States have not been altogether successful, although most of these experiments have started out encouragingly. In any case, it is clear that the organization of a self-governing community among the pupils, while it may result in the effective acquisition of some important civic lessons, will not relieve the teacher of his responsibility for ensuring the welfare of the mass. It is probable that such machinery, once set in motion and then neglected by those in responsible authority, would tend to reflect the evil phases of adult self-government much more faithfully than the good phases. (See Prefect; Self-government.) W. C. B.

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SCHOOL MUSEUMS. — See Museums.

SCHOOL ORDERS. — A term sometimes used for written or printed instructions sent out to teachers, but much more generally used to mean warrants, or drafts, or checks, drawn on the school funds by district boards of trustees (*q.v.*), boards of school directors, or the executive officers of boards of education, in payment of supplies or material furnished, or for labor performed for the school district drawing the same. When school funds are handled by the school boards locally, the orders are drawn on the treasurer of the district; when all school district funds are retained by the county treasurer, as is the case in many Western states, the orders are drawn on the county treasurer. They are used and passed, by endorsement, in the same way as bank checks. E. P. C.

SCHOOL ORGANIZATION AND ADMINISTRATION. — This topic has been treated in a large number of detailed articles, to which the reader is here referred. The topic is very comprehensive, and may be subdivided into state, county, city, and district organization and administration.

For articles on state school organization and administration the reader is referred to the following: NATIONAL GOVERNMENT AND EDUCATION and CONSTITUTIONAL PROVISIONS RELATING TO EDUCATION deal with the relation of national to state school organization and administration. APPORTIONMENT OF SCHOOL FUNDS; SCHOOL FUNDS; SCHOOL FUND COMMISSIONERS; and TAXATION FOR EDUCATION deal with the financial aspect of state organization and administration. ATTENDANCE, COMPULSORY; CENSUS, SCHOOL; CHILD LABOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; and PARENTS AND SCHOOLS deal with the care and protection of the child on the part of the state. STATE AND COMMUNITY; STATE SCHOOL ADMINISTRATION; SCHOOL LAWS AND DECISIONS; and PUPILS' RIGHTS, DUTIES, AND OBLIGATIONS deal with the state in its relation to localities and individuals. PAROCHIAL SCHOOL SYSTEM; PRIVATE SCHOOLS; and STATE *vs.* PRIVATE EDUCATION deal with the relation of the state to extra-state educational endeavor. SCHOOL BOARDS; STATE BOARDS OF EDUCATION; SCHOOL SYSTEMS; SUPERINTENDENTS OF SCHOOLS; and SUPERVISORS AND INSPECTORS deal with the forms of organization for state school administration. COURSES OF STUDY; SUPPLIES, SCHOOL; TEXTBOOKS; and SUPPLEMENTAL BOOKS deal with state and local legislation on these topics. CERTIFICATION OF TEACHERS; EXAMINERS, BOARDS OF; READING CIRCLES; TEACHERS, TENURE OF; and TEACHERS IN SERVICE, EXAMINATION AND TRAINING OF deal with the relations of the state to the teaching force. The articles on the history and present school systems of the different American states, ALABAMA, CALIFORNIA, NEW JERSEY, etc. (*q.v.*), give in detail the form of school organization and administration for each state.

For articles dealing with the county organization and administration, the reader is referred to CERTIFICATION OF TEACHERS; CONVENTIONS, SCHOOL BOARD; COUNTY BOARDS OF EDUCATION; COUNTY SYSTEM OF ADMINISTRATION; HIGH SCHOOLS, COUNTY; INSTITUTES, TEACHERS'; NORMAL SCHOOLS; RURAL SCHOOL SUPERVISION; and SUPERINTENDENTS OF SCHOOLS.

For articles dealing with city school organization and administration, the reader is referred to BUDGET, SCHOOL; BUSINESS MANAGEMENT AND MANAGER; CITY SCHOOL ADMINISTRATION; CITY SCHOOLS, LOCAL BOARDS; COURSES OF STUDY; GRADING AND PROMOTION; STATE AND COMMUNITY; SUPERINTENDENTS OF SCHOOLS; SUPERVISORS AND INSPECTORS; SPECIAL TEACHERS; TEACHERS, TENURE OF; TEACHERS, TRAINING OF.

For articles dealing with district or rural school organization and administration, the reader is referred to CONSOLIDATION OF SCHOOLS; CONVENTIONS, SCHOOL BOARD; COUNTY SYSTEM OF ADMINISTRATION; COURSES OF STUDY; DISTRICT SYSTEM; DISTRICT MEETING; DISTRICT BOARDS OF TRUSTEES; PUPILS' RIGHTS, DUTIES, AND OBLIGATIONS; RURAL SCHOOLS; RURAL SCHOOL PROBLEM; RURAL SCHOOL SUPERVISION; SUPERINTENDENT OF SCHOOLS; and TOWNSHIP SYSTEM. E. P. C.

For school administration in all other countries, see the articles on the respective countries.

SCHOOL OUTINGS AND EXCURSIONS. — See EXCURSIONS, SCHOOL.

SCHOOL PAPER. — See NEWSPAPER, SCHOOL.

SCHOOL PERIODS. — See SESSIONS, LENGTH OF; also HOLIDAYS.

SCHOOL PHYSICIAN. — See MEDICAL INSPECTION.

SCHOOL PLANT, WIDER USE OF THE. — See SCHOOL AS A SOCIAL CENTER.

SCHOOL PLAYS. — See DRAMA AND EDUCATION.

SCHOOL POPULATION. — See CENSUS; SCHOOL AGE.

SCHOOL, PRIMARY. — See PRIMARY GRADES.

SCHOOL PROGRAM. — See SCHOOL MANAGEMENT.

SCHOOL PUNISHMENTS. — See PUNISHMENTS; PUNISHMENTS AND REWARDS.

SCHOOL RECORDS. — See RECORDS AND REPORTS.

SCHOOL REPORTS. — See RECORDS AND REPORTS.

SCHOOL SAVINGS BANKS. — See SAVINGS BANKS, SCHOOL.

SCHOOL SCHEDULE. — See SCHOOL MANAGEMENT.

SCHOOL SISTERS OF NOTRE DAME. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SCHOOL SITES. — See ARCHITECTURE, SCHOOL.

SCHOOL SOCIETIES. — See ASSOCIATIONS, EDUCATIONAL.

SCHOOL STATE. — See SELF-GOVERNMENT IN SCHOOLS; SCHOOL MANAGEMENT.

SCHOOL STATISTICS. — See STATISTICS, EDUCATIONAL.

SCHOOL, SUPERINTENDENCE. — See SUPERVISION.

SCHOOL SUPERVISION. — See SUPERVISION OF INSTRUCTION.

SCHOOL SUPPLIES. — See SUPPLIES, SCHOOL.

SCHOOL SUPPORT. — See FEES, SCHOOL; FREE SCHOOLS; RATE BILL; SCHOOL FUNDS; and TAXATION FOR EDUCATION. Also see the section on *School Support* under the article on each of the American state school systems (ALABAMA; CALIFORNIA, etc.), and each foreign state or nation (FRANCE, GERMANY, etc.).

SCHOOL SYSTEMS, TYPES OF. — The school systems of the world may be classed as national, state, county, or local, according to the plan of organization and the degree of control exercised by the central authority. Among the different so-called national school systems, some are real national systems and others are national only in spirit. The school systems of France and Italy (*qq.v.*), for example, are real national school systems, the power of control exercised by the central authorities at Paris and Rome being very large. The school systems of Australia (*q.v.*) or Germany (*q.v.*), though almost equally centralized in the different states, are not national school systems at all, but a series of highly centralized state school systems. The school system of Prussia differs somewhat from that of Bavaria, Saxony, or Württemberg, as do also the school systems of Victoria, Queensland, or New South Wales, from one another, though naturally there are many national similarities. Each state is left free to carry out its school system as it deems best, though within each state a large degree of central control is exercised. In Canada (*q.v.*) and the United States (*q.v.*) the school systems are also regarded as state school systems, being national only in spirit, but in each of these countries the degree of state centralization and control is much less than in such states as Prussia or New South Wales. A greater degree of centralization exists within the different Canadian states than is the case in most of the American states. (See CANADA, EDUCATION IN, and UNITED STATES, EDUCATION IN, for a more detailed statement of the systems of school organization for the two countries.)

Below the national are the state school systems, which vary greatly in the degree of centralization and control. The Prussian, the New South Wales, the Nevada, and the New York State school system (*q.v.*) are examples of highly centralized state school systems, the state minister or commissioner or superintendent for education possessing large and authoritative powers. The state school systems of Ontario, Maryland, and Indiana (*qq.v.*) represent school systems less centralized than those just named, and in these the state and the locality divide the authority and the responsibility in differing degrees. The state school systems of Switzerland (*q.v.*) and Oregon (*q.v.*), on the other hand, are but loosely organized cantonal or county school systems, the canton or the county being the real unit of educational organization and support, while the state oversight and control is weak. The state school systems of Ohio, Missouri, and Arkansas (*qq.v.*), represent a still further subdivision of authority, the school systems in these states being state school systems only in name, while in effect they are series of small local school systems, — township in Ohio, and district in Missouri and Arkansas, — loosely knit together under either county or state authority. E. P. C.

In addition to the special articles on the different state and national school systems, see also the following: DISTRICT SYSTEM; TOWN SYSTEM; COUNTY SYSTEM OF SCHOOL ADMINISTRATION; STATE SCHOOL ADMINISTRATION; STATE EDUCATIONAL ORGANIZATION; NATIONAL GOVERNMENT AND EDUCATION; and UNITED STATES, EDUCATION IN. For the city as a unit of school organization and administration, see CITY SCHOOL ADMINISTRATION.

SCHOOL TERMS. — See SESSIONS, LENGTH OF; also HOLIDAYS.

SCHOOL TRUSTEE. — See DISTRICT BOARDS OF TRUSTEES.

SCHOOL UNIONS. — By this term is meant the joining of two or more school units, such as districts, townships, towns, etc., for some educational purpose, such as the maintenance of a union school, or a high school, or the employment of a superintendent of schools. Such unions are permitted in most states. The union school idea is an old one, its use being to enable the union of districts to provide what the districts individually could not provide. The union free school of New York, first established in 1853, was of this type. This law provided that any union of two or more districts might be organized for the purpose of providing free schools and the levying of taxes for the same. Its use to-day is for the same general purpose. The California law, permitting two or more districts to unite to maintain a union elementary graded school or a union high school, each district contributing to the cost of maintenance in proportion to its assessed valuation, and each having representation on the union school board of trustees; the Ohio law, permitting two or more townships to unite in the maintenance of a union township high school; and the Massachusetts law, permitting two or more towns to unite in the employment of a union superintendent of schools, are examples of such laws. The county high school laws common in the western states virtually provide for the organization of a union of all the elementary school districts of the county to maintain a county or union high school district. Again, two or more school districts, otherwise independent, may unite in the maintenance of a parental school, or in the employment of an attendance officer. Joint unions mean that the districts uniting are under the jurisdiction of more than one county school officer or board. A high school, for example, might be formed by the union of three school districts, each in a different county, and the school thus formed would be under the joint control, so far as formation, census, finance, and yearly reports, at least, were concerned, of three different county superintendents of schools, or three different county boards of education. In most states it is customary to give the immediate supervision of the school to the school officer in whose county the school is located. E. P. C.

See also JOINT DISTRICTS; CONSOLIDATION OF SCHOOLS.

SCHOOL UTENSILS. — See DISINFECTION.

SCHOOL VISITATION. — See SUPERVISION; VISITATION.

SCHOOL VISITING. — See TEACHERS, TRAINING OF.

SCHOOL YEAR. — See SESSIONS, LENGTH OF; also HOLIDAYS.

SCHOOLING AND AGE CERTIFICATES. — See LEAVING CERTIFICATES.

SCHOOLMASTER. — See MASTER.

SCHOOLROOM. — See SCHOOL MANAGEMENT; ARCHITECTURE, SCHOOL.

SCHOOLROOM MANAGEMENT. — See SCHOOL MANAGEMENT.

SCHOOLROOM TEMPERATURE AND HUMIDITY. — See HEATING; VENTILATION.

SCHOOLS, COST OF. — See COST OF EDUCATION.

SCHOOLS INQUIRY COMMISSION. — See PARLIAMENTARY EDUCATION COMMISSIONS; ENGLAND, EDUCATION IN.

SCHOPENHAUER, ARTHUR (1788–1860). — The German philosopher, was born in Danzig, Feb. 22, 1788, and died in Frankfort, Sept. 28, 1860. At Göttingen he began a diligent study of " Plato the divine and the marvellous Kant," both of whom gave shape to his philosophy. He also came under the influence of G. E. Schulze, Fichte, Schleiermacher, and Wolf, the classicist, and later of F. Mayer, the orientalist. Schopenhauer's career was uneventful, marked only by his failure as a university lecturer at Berlin (1820). He devoted himself to the tasks of authorship in expounding his metaphysical and ethical principles, and was destined to a long, impatient waiting for belated renown as a philosopher. Bearing the hereditary seeds of a mental malady and suffering from the strong temperamental differences of his parents, he exhibited a conspicuous personality, distorted by unsatisfied yearnings and a special capacity for sensing pain. His pessimism is an instance of the close connection that exists between the individual experiences of a thinker and his philosophy.

In his chief work, *The World as Will and Idea* (1818, Engl. tr. 1883), Schopenhauer presents what he claims to be the true and final development of the critical philosophy of Kant. He articulates epistemology, metaphysics, art, and ethics into a hundred-gated system. The world of experience is only " my idea." Science, being only an expression of intellect, leads us astray from philosophical truth. The reality behind appearances and ideas is blind, unconscious, universal Will, — the feelings and desires in all forms of existence ever struggling to self-assertion and never being satisfied. This thing-in-itself is identical in nature and humanity, in body and will. As a metaphysical power it objectifies itself in inorganic and organic nature, reaching its apex in the human brain, where it comes to intellectual and moral consciousness. In its struggle for existence, will induces inevitable and necessary suffering, from which there are only two modes of release. Man may find unity with all things through the forms of art, where the observer transcends all individuality and beholds the Ideas as the eternal forms of Will. The aim of morality is to lead man to deny the will-to-live, and thus escape pain as the price of existence, until the unconsciousness of absolute negation is reached. His other important writings, *Will in Nature* (1836) and *Parerga and Paralipomena* (1851), are collections of observations on his main thesis of the primacy of Will, or applications of his pessimism to the affairs of human life. His philosophy attracted no attention until toward 1850.

Education presented a field in which Schopenhauer had a lively interest. Without systematizing his conclusions, he scatters his observations on training children and youth and makes application of his philosophical principles in his main work and in a number of essays, such as *Education* (in *Studies in Pessimism*), *Thinking for Oneself*, *The Study of Latin*, *Men of Learning*, *Authorship and Style* (in *The Art of Literature*), all translated by T. B. Saunders.

Schopenhauer's metaphysics of will and ethical pessimism preclude the possibility of education in any real sense of the word. Character is born with a person, and is therefore unalterable. With the unchangeableness of the characteristics of will, education cannot hope to lessen suffering, much less bring in happiness. There is no evidence of progress in history, and the bulk of mankind is regarded as indifferent and the plaything of impersonal forces. To such views there can be no justification of education, positive belief in which is directly based on a keen interest in the intrinsic worth of humanity and on a recognition of its capacity for development. His ideals of art, self-negation, and philosophy provide no room for the aim of education conceived by those who take an ethical view of the process, or who regard mind as resulting from educative forces.

On the other hand, Schopenhauer's view of eduaction is consistent with his philosophy. Since education touches only the intellectual, and not the volitional, functions, it is restricted to phenomenal experience. Its limits are fixed by inheritance in both intellect and will. It is possible in childhood, because then the cerebral and nervous system preponderate, and consequently intellect is more in evidence, will being held in check until puberty. "The mental powers develop much earlier than the needs they are destined to serve," and consequently "children are so sensible, reasonable, desirous of information and teachable, and are more disposed and fitted for all theoretical occupations than grown-up people (*World as Will and Idea*, ch. 31). The end of education is "to acquire a knowledge of the world." This was the kind of education given him by his father, and it is in agreement with his inductive procedure in philosophizing. The chief question in education accordingly becomes that of the method of teaching which shall produce adequate knowledge, and he adopts for guidance a principal conclusion in his epistemology (*Ibid.*, Bk. I, §§ 8, 9). Concepts always presuppose things, and arise by abstraction out of intuitions or perceptions, which come first in the order of time. This is the character of natural education, as shown by the fact that experience teaches directly. Artificial education, which allows the mind to become filled with concepts gathered from reading or through improper teaching before there is any acquaintance with the appropriate part of the sense-world, leads to error in knowledge and action and produces distorted and perverse beings. In thus demanding the use of the methods of truth in education, he is in general agreement with the pedagogy of Locke, Rousseau, and others. Up to the sixteenth year of age, perception and memory are the cognitive functions to be exercised. The youth is to be persistently engaged in collecting facts in the fields of mathematics, language, natural science, and history. The current practices in education, which import "finished" thoughts into the child's mind, he severely condemns because they are a permanent source of prejudice and error. On this ground is condemned also the early teaching of philosophy, religion, and general views of every kind. The unreal fantasies of most novels make the reading of them by children bad. Selected biographies offer much better material for teaching. The logical subjects have little educative value. Geometry should be taught by immediate perception, and not by the reasoning Euclid introduced. By his high regard for the classical literature of Greece and Rome as the best expressions of humanity, and his contempt for patriotism in national letters and science, Schopenhauer became a neo-humanist. Acquaintance with many languages, Latin being the chief, is a direct means of mental culture. His conviction as to the positive value of the classics was so strong as to lead him to prophesy that, should they cease to be taught (as was then threatening), "the age of barbarism will return, in spite of railways, telegraphs, and balloons."

The direct application of pessimism appears in his denial of so-called moral education. Direct will training is impossible, for character is fixed. Action may be affected indirectly by changing or improving motives through the channels of organized or widened knowledge. The hope of advancing a pupil's morality by teaching him that the maxims of right and virtue are usually followed, is false. When he later discovers the deception, his own morality will suffer. Instead it is better to teach the child: "Humanity is bad; but you should be better." Schopenhauer also distrusted the apparent evidences of education in society. The many different kinds of schools create the impression that the race is very much concerned about insight and truth. He believed, however, that the great majority taught and learned "only to earn money." He was venomous toward the university faculties, and especially toward their attempts to teach philosophy. His failure to succeed as a *privat-docent* at Berlin he attributed to the intrigues of his colleagues. The prize essay on his system of philosophy, accepted by the University of Leipzig in 1856, let his fury loose again. "He who holds a professorship may be said to receive his food in the stall; and this is the best way with ruminant animals."

E. F. B.

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SCHULZE, JOHANNES (1786-1869). — One of the founders of the present system of higher education in Prussia, was born at Bruel, a town in Mecklenburg, studied theology and philology at Halle, where he came under the influence of Schleiermacher (*q.v.*) and F. A. Wolf (*q.v.*), then at Leipzig, where he attended the lectures of the great classicist Gottfried Hermann. In 1808 he was appointed professor of the gymnasium at Weimar, and in 1812, professor of the gymnasium at Hanau. In 1815 he entered the Prussian service as school superintendent (Schulrat) in Koblenz. In 1818 he was called to Berlin by Altenstein (*q.v.*) as councilor in the newly founded ministry of education. In this position for forty years he greatly affected the development of the Prussian higher schools and universities.

His most important work was with regard to the course of study in the gymnasium and the preparation of its teachers. He retired in 1858. He published a collection of his *School Addresses* (*Schulreden*, Leipzig, 1819-1830, 2 vols.), an edition (together with H. Meyer) of Winckelmann's *History of Ancient Art* (Dresden, 1809-1815, 4 vols.), and of Hegel's *Phenomenology of the Mind* (Berlin, 1841). F. M.

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SCHUPP, JOHANN BALTHASAR (SCHUPPIUS) (1610-1661). — A German preacher and satirist. He was born in Giessen, and, until the age of nineteen, studied philosophy and theology at the University of Marburg. In accordance with the custom of the times, he then set out on a journey on foot through the greater part of Germany, the Baltic provinces, Denmark, and Poland, undergoing various adventures in those troubled times of the Thirty Years' War, studying everywhere the life of the people, and stopping at various universities to enlarge his knowledge of theology. In 1632 he began to lecture in Marburg, but interrupted this work to undertake a journey to Holland, where he studied at the University of Leyden. In 1635 he was appointed professor of history at Marburg and taught there until 1646, when he accepted a position as court preacher to the Count Johann of Hessen-Rheinstein at Braubach. In 1649 he was called to Hamburg as pastor of St. Jacob's church, and died there at the age of fifty-one years.

Schupp belongs to the best German prose writers of his time. In his many pamphlets and sermons he vigorously attacked the foibles and vices of his contemporaries. He advocated a reform of the schools, insisting on the study of the mother tongue and on the restriction of the time given to Latin. He also demanded a better financial status of teachers, and declared that there would be no good schools in Germany until teaching was entirely separated from the clerical profession, — a thought which was about two centuries ahead of his age. F. M.

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SCHWARZ, FRIEDRICH HEINRICH CHRISTIAN (1776-1857). — German theologian and educationalist, born and educated at Giessen, in both the Latin school and the university. For a time he was a Lutheran minister, but in 1804 he was appointed professor of theology at Heidelberg, the first Lutheran professor at that university. Schwarz always took a particular interest in education; he assisted in the direction of a philosophical-pedagogical seminar, was inspector of schools and churches, and for a time principal of a private school at Dexbach. As a student of education he was well-informed on the current theories of his day and in his works aimed to reconcile the naturalistic with the theological attitude to education, adopted Pestalozzi's methods and theory as to sense-perception and harmonious development and Herbart's view of the educative aim of instruction. His many educational writings include: *Grundriss einer Theorie der Mädchenerziehung in Hinsicht auf die mittleren Stände* (1792); *Erziehungslehre*, 4 vols. (1802-1813); *Lehrbuch der Erziehungs- und Unterrichtslehre* (1805); *Gebrauch der pestalozzischen Lehrbücher beim häuslichen Unterricht* (1904); *Die Schule* (1832); *Darstellung aus dem Gebiete der Pädagogik*; and a number of books on moral and religious instruction. He also edited the *Freimütige Jahrbücher zur Verbesserung des Volksschulwesens.* An important contribution was made by Schwarz to the study of the history of education, which he issued in 1813 with the title, *Erziehungslehre.* (See History of Education.)

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SCHWARZBURG-RUDOLSTADT, PRINCIPALITY OF, EDUCATION IN. See German Empire, Education in.

SCHWARZBURG-SONDERSHAUSEN, PRINCIPALITY OF, EDUCATION IN. — See German Empire, Education in.

SCIENTIFIC METHOD. — Science and Education. — The term science in the sense of knowledge (*scientia*) was long used to include the entire subject matter of study. (See Knowledge.) During the last two or three centuries the term has been commonly restricted to one of two senses: first as a general method of organization or investigation applicable to the phenomena of almost any field; second, as a term to include the various aspects of the study of natural phenomena; that is, natural science. The first aspect of the term is discussed under the captions Experimentation, Hypotheses, Induction and Deduction, Logic, etc. (*qq.v.*). Even in the second aspect of the term, the sciences form too large a part of modern education to be discussed adequately in one article. The historical development, the present place of the sciences in education, their scope and method are therefore presented in this work under the following captions: Anthropology; Astronomy; Botany; Geography; Geology; Hygiene; Nature Study; Physiology; Physics; Sanitary Science; Zoölogy, etc. The applied aspects of these subjects are treated in the articles dealing with the various aspects of professional and technical education; for these see Agricultural Education; Industrial Education; Medical Education; Pharmaceutical Education; Physical Education; Sanitary Science, Education in.

Philosophical Concept of Science and Scientific Method. — Science is usually defined as systematized knowledge. The definition, while correct as far as it goes, is incomplete. Everyday knowledge, the knowledge held in solution in "common sense," is systematized. It is not a casual heap of disconnected scraps. The bonds of union and the principles of arrangement in such knowledge are mainly practical and social. The knowledge is ordered, but it is not ordered from the standpoint of and for the sake of knowledge. Not, then, the presence of systematization characterizes science, but the presence of a peculiar principle and method of systematizing. Science is knowledge systematized from the standpoint of and for the sake of knowledge, as distinct from the standpoint of practice and social intercourse. Specifically this means that the subject matter of knowledge is (*a*) selected, (*b*) formulated, and (*c*) arranged with special reference to the exhibition of the relations of intellectual dependence which its various parts sustain to one another. A typesetter will specify and arrange his knowledge of letters with reference to their effective use in his calling. The letters will be arranged (systematized) in his case with the same reference to convenience of use. A scientific treatment considers them as vowels and consonants, and subdivides vowels and consonants with a view to exhibiting principles of unity and of graded diversification among them.

Further analysis shows that the arrangement which brings to light relation of intellectual interdependence is one which is concerned with the subject matter from the standpoint of premiss and conclusion in inference. That is to say that a scientific systematization of subject matter means the subject matter is organized so as to promote the easy passage of thought from any portion to any other through logical inference. The material is selected and disposed so that one part is a logical conclusion from other parts, while in turn it serves as a premiss from which, in combination with other parts, still further conclusions may be drawn. Moreover this premiss-conclusion relation is two-sided. On the one hand, it is concerned with proof or testing. Certain considerations in the subject matter may be resorted to in order to guarantee or justify certain other propositions. On the other hand, it has to do with facilitating the inferring of new conclusions, or the promoting of discovery. In any given science we attempt to state our knowledge in such form that it will answer both of these requirements: so that we may test any given proposition by noting whether and how it follows from other propositions taken as established, and also may utilize given propositions to arrive at others not previously known. The processes of obtaining data (or evidence), of definition (or fixation of meaning), of generalization (or reduction to principles), and of classification (or graded grouping) characteristic of any science, are the means taken to satisfy these requirements.

The conception of science derived from emphasizing the method which yields systematization, instead of resting in the mere fact of the accomplished system, has important educational consequences. What is taught as science is often nothing more than a peculiar or technical body of information (*q.v.*). Externally speaking, it is science. That is, at some time it was actually reached by processes of reflective inquiry conforming to the general canons just mentioned. Moreover, it is labeled science in the educational scheme. But in so far as the pupil is unaware of the processes of reflective thought which give the information its characteristic scientific status, it has no real right to the title of science, and in so far as he does not himself go through these processes and thereby take an active part in performing the specific logical processes that transform the body of facts and laws into a science, there is no genuine study of *science*. There is merely the acquisition of a certain bulk of externally communicated information, information which is, indeed, distinctive in its technical teminology, but which for that very reason is more remote from any actual thinking on his own part than acquired information of a more familiar sort.

It may be seriously questioned whether these considerations do not throw light upon the failure of much science teaching to realize the expectations of those who have been especially urgent in securing the introduction of science into the curriculum. When science is taught as so much ready-made subject matter, instead of as a subject matter in process of making, by means of the mastery and use of certain methods of inquiry and reflection, there is no more reason to expect results of intellectual enlightenment or practical utility than in the case of memorizing a collection of nonscientific material. While the introduction of laboratory equipment and the use of experiment and observation furnishes, of course, one indispensable factor in the teaching of science as method, it does not of itself meet the entire need. It is possible for students to gain facility in the manipulation of materials and apparatus without gaining an insight into the significance of what is done from the standpoint of its rôle in genuine thinking, or the making of valid knowledge. As long as the ideal of the acquisition of information persists as the dominant ideal, so long the salient value of science for educational purposes, the mastery of the most effective methods of thinking and their translation into personal attitudes and habits will be obscured or ignored.

When science is approached from the standpoint of method, it is obvious that no absolutely new operations are involved in it. It does not depart from the factors employed in the reflective examination of any topic (see PROBLEM; HYPOTHESIS; EXPERIMENT; also METHOD and INDUCTION) so far as introducing new operations is concerned, but only by supplying the conditions of increased control and care under which to carry on these operations. If scientific methods departed essentially from the methods of reflection and deliberation employed in the daily affairs of life, education in them would be of comparatively little avail outside of the specialized pursuit of a science. But since they present a purification and intensification of the usual methods through making precise and adequate the conditions that enter into their use, proper teaching of scientific method affords the most effective of all agencies for correcting, extending, and confirming the habits of reflection indispensable to a cultivated and useful life. This proper teaching, in addition to the emphasis upon intellectual method already considered, demands that the growth of scientific problems out of the situations of everyday life be taken into account, instead of plunging at once into the technical scientific material without a modulated transition, and that pains be taken to insure application of scientific results to the interpretation of everyday situations. J. D.

SCIENTIFIC PEDAGOGY. — See EXPERIMENT IN EDUCATION; PSYCHOLOGY, EDUCATIONAL; also TESTS; CHILD STUDY.

SCIENTIFIC SOCIETIES. — Organizations of persons associating together for mutual interchange of ideas and the advancement of either science in general or some special branch. Historically such societies were general in character, as might be expected from the limited range of scientific knowledge. Their development is almost parallel with that of academies (*q.v.*), a term generally but not always reserved for societies for the promotion of learning in other fields than science. While scientific societies are found springing up here and there in Europe in the seventeenth century, their multiplication and further development belong to the latter part of the eighteenth and the whole of the nineteenth centuries. As the different departments of scientific knowledge increased in scope and became more and more specialized, branches were split off from the older and more general societies or entirely new organizations were formed. But the very increase and specialization led to the need of some organization of a general character and wider scope, national or international, which would offer a common meeting place for the more scattered branches and unite scholars for the promotion of science in general. Hence there arose societies like the British Association and the American Association, each with its twelve sections. Side by side with the societies for scientific inquiry, there also arose in the last century societies for the study of the applied professional branches, such as medicine, industrial chemistry, engineering, etc.

Like other societies, scientific societies arose in response to a need felt by persons of similar ideas for opportunities of meeting together, reporting on and discussing recent progress in their own field. Since the sciences were neglected by the universities, these societies served a further want. Besides affording opportunities for meetings and discussions, scientific societies have helped to organize research, have recorded discoveries, have assisted students, and have encouraged study through prizes, medals, etc. Further, the existence of common centers prevents overlapping, secures recognition where it is due, and provides for continuity of research. Most societies of standing publish records of their work under the title of *Papers, Proceedings, Transactions, Publications*, or *Memoirs.*

England. — Scientific societies in England take their origin from three societies which at first embraced the sciences in general and then sent out offshoots for specialized departments or were imitated on smaller scale. The earliest society in England was probably the Society of Antiquaries which was founded by Archbishop Parkes and began to hold meetings in 1572 at the house of Sir Robert Cotton for the study of "the antiquities of this and other nations." It enjoyed the favor of Queen Elizabeth, but for some reason it was dissolved by James I in 1604, to be revived in 1707, reconstituted in 1718, and chartered in 1751. This society led to the foundation of the following: Society of Antiquaries of Scotland, 1780; Literary and Antiquarian Society of Perth, 1744; Society of Antiquaries, Newcastle-on-Tyne, 1813; Royal Numismatic Society, 1836; Royal Society of Antiquaries of Ireland, 1849; Royal Historical Society, 1868; Society of Biblical Archæology, 1871; Palæontographical Society, 1873; Society for Hellenic Studies, 1879; Royal Archæological Institute, 1843; British Archæological Association, 1843; Ethnological Society, 1843; Anthropological Society, 1863; Anthropological Institute, organized by union of the two preceding, 1871, and called "Royal" since 1907; Folk Lore Society, 1878. In 1645 a small society was formed in London for scientific study, and held weekly meetings. From this a branch was split which was organized at Oxford in 1848–1849 as the Philosophical Society, and continued until 1690. In 1660 the Royal Society was established and was chartered in 1662, many members of the earlier society being enrolled.

Royal Society. — In 1662 the Society was incorporated by royal charter from Charles II under the title of the Royal Society, a name which it is stated was first used by John Evelyn. The charter was confirmed in 1669. Gresham College was the recognized place of meeting. The Royal Society from the first supported and announced important discoveries. It is claimed that in the disputes with regard to Dr. William Harvey's doctrine of the circulation of the blood, the Royal Society consistently supported Harvey. Boyle's experiments with the air, culminating in his air pump, and Goddard's experiments with colors were amongst the earlier records of the Society. Petty produced accounts of experiments with regard to shipping, and Christopher Wren on the pendulum. Already in 1661 a committee was appointed to consider "questions to be inquired of in the remotest parts of the world." King Charles II sent communications with inquiries as to loadstones and sensitive plants, and Wren was requested to make a globe of the moon for the king. In 1665 the Society ordered the Philosophical Transactions to be composed by Henry Oldenburg to be printed monthly if there were sufficient matter. After the Great Fire of London in 1666, Henry Howard made a gift to the Society of the Library of Arundel House. The collection consisted of 3287 books, chiefly first editions of books soon after the invention of printing, together with 544 volumes of choice Mss. The present library of the Royal Society consists of over 60,000 scientific books on scientific subjects.

Earlier in 1666, a collection of rarities belonging to Mr. Hubbard was purchased and became the nucleus of the Royal Society's Museum, which has for the most part been dispersed. One of the most interesting facts about the Royal Society is the association with it of Sir Isaac Newton, who was elected a Fellow in 1671, but held the presidency from 1703 to 1727, in which year he died.

The Royal Society was in close touch with foreign scientists from the first. Amongst the earliest members were Theodore Haak and Nicholas Mercator. Marcellus Malpighi, the great biologist, sent communications from 1669 onward, and in 1671 the great Leibnitz dedicated a work to the Society. Huguenot religious refugees, including Denis Papini, De Noivre, Durand, Desaguliers, and Desmaizeaux, were a great intellectual and particularly a scientific asset to England and to the Royal Society.

In 1730 the number of foreigners who were members was seventy-nine, and it was at that date resolved that those foreign members, who had previously paid the same subscription as English members, should be absolved from payments. In 1780 a tendency set in to render admission more difficult. In 1847 it was decided that the number of admissions to the Society by the Council should be limited to fifteen yearly, and this limitation is still in force. Fellows by the constitution of the Society pay entrance fees and subscriptions, but a fund was provided in 1878 which reduced the payments required. The rest of the income is derived from rents and interest on various investments. Copley, Davy, Hughes, Rumford, Darwin, Sylvester, Buchanan, are among the most distinguished members, and the two royal medals are amongst the most distinguished recognitions of scientific work of Great Britain. The Royal Society is intrusted by the government with the administration of the annual grant of £4000 for the promotion of scientific research, and also receives £1000 in aid of scientific publications. The Society publishes a *Yearbook* and a *Record* of its history (1901). Of the papers read before the Society, a selection is made by a Committee *ad hoc*, and these are published in the *Philosophical Transactions* or in the *Proceedings of the Royal Society*. The Royal Society has also issued a work of altogether outstanding importance, viz. the *Catalogue of Scientific Papers*, an *Index* under authors' names to the chief English and foreign scientific periodicals from 1800 to 1883, in twelve volumes. This *Catalogue* has recently been continued to the end of the nineteenth century, with the addition of a subject index to the whole catalogue.

Other National Societies. The most prominent organizations in the eighteenth century were the Medical Society, 1773, the Linnæan Society for Natural History, 1788, both direct offshoots of the Royal Society, and the Royal Institution (*q.v.*), 1799. How specialized were the societies formed in the last century becomes obvious from a reading of their names: Horticultural Society, 1804; Zoölogical Society, 1826; Entomological Society, 1833; Ornithological Society, 1837; Royal Botanic Society, 1839; Ray Society (for the publication of works on British natural history), 1844; Geological Society, 1807; Geologists' Association, 1858; Mineralogical, 1876; Royal Astronomical Society, 1870; Royal Geographical Society, 1830; Institution of Civil Engineers, 1818; Institution of Mechanical Engineers, 1847; Mining Engineers, 1851; Iron and Steel Institute, 1869; Electrical Engineers, 1871. Mathematics, physics, and statistics have each their special societies; while medicine, general and special, is represented by a large number of organizations. Although the most important societies are necessarily located in the capital, there are numerous provincial societies which in their own way make their contribution to scientific progress. In Scotland the Royal Society found an early imitator in the Royal Society of Edinburgh, a reorganization in 1783 of the Edinburgh Philosophical Society which had been founded in 1737. The Royal Society of Edinburgh is divided into two classes, literary and physical, the latter being the more active and awarding prizes for scientific work. The Royal Philosophical Society of Glasgow was founded in 1802 "to aid the study and development of the physical, mental, and moral sciences, the arts of design, and the diffusion of scientific knowledge." In Ireland the Royal Society of Dublin, 1731, and the Royal Irish Academy, 1786, were founded to promote among other studies that of science.

The third society which has served as the model and parent of many others, especially in the field of the applied sciences and design, is the Society for the Encouragement of Arts, Commerce, and Manufactures, 1754, known since 1909 as the Royal Society of Arts. It was founded "for the encouragement of the arts, manufactures, and commerce of the county by bestowing rewards for inventions, services in fine arts, improvements in applied science. . . ." An art exhibition held by the Society led to the foundation of the Royal Academy, and the Society was responsible for suggesting the International Exhibition of 1851. As a result of meetings held by the Society, there were formed the Chemical Society, 1841; Institute of Chemistry, 1877; Society of Chemical Industry, 1881; the Sanitary Institute, 1881, and several others. In 1821 the Royal Scottish Society of Arts was established; and in 1838 the Royal Agricultural Society, which had already been preceded by agricultural societies in Scotland and Ireland.

Of a somewhat different character, although similar in aim, is the British Association for the Advancement of Science, which met first on the suggestion of Sir David Brewster at York in 1831. Its aim is "to promote science, to direct general attention to scientific matters, and to facilitate intercourse among scientific men." Unlike the other societies, the British Association is itinerant and meets each year in a different town of the British dominions. The Association has eleven sections, as follows: (*a*) mathematical and physical science; (*b*) chemistry; (*c*) geology; (*d*) zoölogy, (*e*) geography; (*f*) economic science and statistics; (*g*) engineering; (*h*) anthropology; (*i*) physiology; (*j*) botany; (*k*) educational science.

The following may be given as a representative, but by no means complete, list of English scientific societies located in London; no account is here given of the numerous and important provincial societies.

	DATE OF FOUNDATION
Royal Astronomical Society	1820
London Mathematical Society	1865
Royal Meteorological Society	1850
Physical Society of London	1874
Chemical Society	1841
Institute of Chemistry of Great Britain and Ireland	1877
Pharmaceutical Society of Great Britain	1841
Royal Geographical Society	1830
Geological Society of London	1807
Linnæan Society of London	1788
Royal Anthropological Institute of Great Britain and Ireland	1871
Zoölogical Society of London	1826
Royal Botanic Society of London	1839
Royal Microscopical Society	1839
Anatomical Society of Great Britain and Ireland .	1887
Ray Society	1844
Royal Statistical Society	1834
Institution of Civil Engineers	1818
Institution of Mechanical Engineers	1847
Royal Agricultural Society of England	1838
Royal Horticultural Society	1804
Medical Society of London	1773
British Medical Association	1832
Lister Institute of Preventive Medicine	1891
Royal Society of Medicine (formed by the amalgamation of numerous sectional medical societies which had sprung up during the century) . . .	1907

United States. — Owing to the natural and material difficulties to be overcome in a young and unsettled country, the progress of science and the demand for scientific information developed slowly in the United States. To this fact must be added the inadequacy of the schools and the neglect of the sciences in the colleges. In the first century of its existence there were many American members of the Royal Society. When the American scientific societies began to be established, two influences may be noticed; the one came from England, and the societies were founded in imitation of the Royal Society, especially under Franklin's influence; the other came from France, and even the French titles were adopted, as in the case of the American Academy of Arts and Science at Boston. The latter influence may also be traced in Jefferson's (*q.v.*) proposals during his presidency of a central institution. The first suggestion for the foundation of a scientific society came from Benjamin Franklin (*q.v.*) in a paper entitled: *Proposal for promoting useful Knowledge among the British Plantations in America.* In the following year he founded the American Philosophical Society, of which Thomas Hopkinson was president and himself secretary, and which included John Bartram, the botanist, and Thomas Godfrey, the mathematician. This society was soon discontinued, however, only to be revived and reorganized in 1767–1768 as the American Society held at Philadelphia for Promoting Useful Knowledge. In 1769, on the occasion of a union with the Junto, or Society for the Promotion of Useful Knowledge (f. before 1758), the title was changed to the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge, of which Franklin was president till his death. This is probably the oldest society of its kind in the country, has published *Transactions* since 1789, *Proceedings* since 1833, and has a large library. The Academy of Natural Science of Philadelphia was founded in 1812 and is devoted to the study of natural history. It possesses the most complete museum and library in this subject in the country and a valuable museum in conchology and ornithology. The American Academy of Arts and Science was founded in Boston in 1780 to encourage the study of American history and the natural history of the country. The Linnæan Society, founded in 1814, was succeeded by the Boston Society of Natural History, 1830, for general nature study. It possesses a library and collections of New England natural products and mineralogy. In 1799 the Connecticut Academy of Arts and Science was established at New Haven for the collection of statistics of the state, but later added also the study of science. The work of the Lyceum of Natural History, 1818, has been continued by the New York Academy of Science, 1876, which possesses a library and museum of natural history, and published *The New York Academy of Science* (1876), a continuation of the *Annals of the Lyceum of Natural History* (1824–), and the *Proceedings* (1873–), and *Transactions* (1881). The Peabody Academy of Science was founded by George Peabody (*q.v.*) at Salem, Mass., for the promotion of science and useful knowledge. The American Association for the Advancement of Science originated at Boston at a meeting of the Association of American Geologists and Naturalists in 1847, and its purpose was declared to be "by periodical and migratory meetings to promote intercourse between American scientists, to give a strong and more systematic impulse to research, and to procure for the labors of scientific men increased facilities and wider usefulness." Annual meetings are held in different towns of the country and *Proceedings* have been published since 1849. Since 1900 *Science* has been the official organ of the Association. The following sections are represented in the Association: (*a*) mathematics and astronomy; (*b*) physics; (*c*) chemistry; (*d*) mechanical science and engineering; (*e*) geology and geography; (*f*) zoölogy; (*g*) botany; (*h*) anthropology and psychology; (*i*) social and economic science; (*k*) physiology and experimental medicine; (*l*) education. Many other societies are affiliated and hold their meetings at the same time and place as the American Association. The National Academy of Science was organized in 1863 as the successor of the National Institution for the Promotion of Science and the Useful Arts, which had been organized at Washington by Act of Congress in 1840, to collect scientific material for the United States National Museum (*q.v.*). The National Academy examines and reports on scientific questions submitted to it by government departments, which pay the actual expenses of the investigation. The original membership was limited to fifty, but this restriction has been removed. There are two sections: mathematics and physics, and natural history. The Washington Academy of Science was founded in 1898 out of a number of other societies,—the Anthropological Society, Biological Society, Geological Society, National Geographical Society, the Medical Society of the District of Columbia, and the Philosophical Society of Washington.

The following is a list of the more important national, state, and local scientific societies which are actually engaged in promoting research or in making collections of materials upon which the scientist may work, especially in the fields of natural history, archæology, anthropology, and ethnology.

	DATE OF FOUNDATION
American Anthropological Society	1902
American Chemical Society	1876
American Historical Society	1884
American Library Association	1876
American Mathematics Society	1894
American Physical Society	1899
American Social Science Association	1865
American Society of Naturalists	1883
American Statistical Association	1839
American Archæological Institute	1879
American Ethnological Society	1842
American Geographical Society of New York	1852
American Numismatic and Archæological Society	1858

	Date of Foundation
Association of Engineering Societies	1880
Agassiz Association	1875
Boston Scientific Society	1876
The Botanical Society of America	1894
Brooklyn Institute of Arts and Sciences (*q.v.*)	1823
California Academy of Sciences	1853
Carnegie Institution of Washington	1902
Chicago Academy of Sciences	1856
Cincinnati Society of Natural History	1870
Colorado Scientific Society	1882
Davenport, Ia., Academy of Science	1867
Indiana Academy of Science	1885
Iowa Academy of Science	1891
Kansas Academy of Sciences	1868
Michigan Academy of Sciences	1894
Minnesota Academy of Sciences	1873
North Carolina Academy of Science	1902
Ohio State Academy of Science	1891
Academy of Natural Sciences of Philadelphia	1812
Academy of Science of St. Louis	1856
Astronomical Society of the Pacific	1889
Geographical Society of the Pacific	1881
Texas Academy of Science	1892
Wisconsin Academy of Sciences, Arts, and Letters	1870

See also Educational Associations; Teachers' Voluntary Associations; and Medical Associations.

France. — The scientific societies of France are a product largely of the nineteenth century and to a large extent are located in Paris. The prototype of them all, however, the Académie des Sciences, was definitely established in 1666 by Colbert, and had probably been in existence unofficially several years before that date. Originally it met for the discussion of mathematical and physical questions. It was reorganized in 1699 and received royal approval, and was thus placed on an equal footing with the other academies. (See Academy.) In 1785 its work was divided among eight sections: geometry, astronomy, chemistry, metallurgy, botany, agriculture, natural history, and mineralogy. During the Revolution it was not dissolved permanently, like the other academies, but was retained by the government for the public good. In 1795 the Académie des Sciences became a class of the newly created Institut National with ten sections: geometry, mechanics, astronomy, general physics, chemistry, mineralogy, botany, rural economy, anatomy and zoölogy, medicine and surgery, to which another section — geography and navigation — was added later. The Académie des Sciences publishes *Comptes rendus hebdomadaires des Séances*, and *Mémoirs*. (See Institute, French.) Another class, the fifth of the Institut de France, is the Académie des Sciences morales et politiques, established in 1795 for the study of philosophy, history, and political science. It was suppressed in 1803 by Napoleon, but was revived in 1832. Its work is covered by five sections: philosophy; ethics; legislation, public law, and jurisprudence; political economy, statistics, and finance; general and philosophical history. It publishes *Mémoirs* (since 1835) and *Séances et Travaux* (since 1842). The Académie de Médecine was established in 1820 to continue the work of the Société de Médecine and the Académie de Chirurgerie (1731), which had been dissolved in 1793. It is an official body, in so far as the government may refer to it on questions of public health. It consists of ten sections: anatomy and physiology, medical pathology, surgical pathology, therapeutics and medical natural history, pathological anatomy, obstetrics, public health and sanitation, veterinary medicine, medical physics and chemistry, and pharmacy.

These academies are public bodies and are maintained by the government, which pays annual salaries to the members and awards prizes and honors. But, unlike other countries, the government also subsidizes many of the other scientific societies of the country, and through the Comité des Travaux historiques et scientifiques in the Ministry of Public Instruction and Fine Arts it directs and coördinates the work of the societies. This Comité, founded in 1834 and reorganized by decree of May 12, 1883, consists of a president and members representing the five sections: history and philosophy; economic and social sciences; archæology; physics and chemistry, meteorology, and natural sciences; historical and descriptive geography. It encourages intercourse between different societies, directs their publications, and organizes scientific congresses annually in Paris. It also publishes a number of pamphlets and bulletins bearing on the work of each section and a bibliography of the publications of the societies. Congresses of scientific societies have been held in France since 1833, the first, the Congrès scientifique, meeting at Caen. In 1862 a Congrès des Sociétés Savantes, in imitation of an annual congress organized in 1846 by M. de Caumont, met at the Sorbonne under the auspices of the Ministry of Public Instruction and Fine Arts. This congress now meets annually at the Sorbonne under the sections: history and philology, archæology, and sciences. Founded in imitation of similar societies in England and America, the Association française pour l'Avancement des Sciences is a migratory body holding annual conferences in different parts of France to stimulate progress and diffusion of the sciences, theoretical and applied. It was established in 1872, and in 1885 was amalgamated with the Association scientifique de France (f. 1864). Among other general scientific societies may be mentioned the Conférences Ampère, established in 1888 for the study of sciences and philosophy: the Société philomathique de Paris, established in 1788 for the study of mathematical, physical, and natural sciences; the Société philotechnique, founded in 1795, to promote the study of letters and sciences. In the following list of French scientific societies the majority are national in scope and are located in Paris. Of the provincial societies, however, only a few are selected; they are very numerous, and in many cases are doing work of an important character. Many of the French societies have received charters of incorporations (*reconnaissance d'utilité publique*), but this incorporation is not so universal as in Great Britain and the United States.

	Date of Foundation
Société astronomique de France	1887
Société mathématique de France	1872
Société chirurgique de Paris	1858
Société de chimie-physique	1908
Société française de Navigation aerienne	1872
Société française de Physique	1873
Société météorologique de France	1852
Société botanique de France	1854
Société d'Anthropologie de Paris	1859
Société de Biologie	1848
Société française de Mineralogie	1878
Société géologique de France	1830
Société zoologique de France	1885
Association française de Chirurgie	1884
Société de Médecine de Paris	1796
Société d'Hypnologie et de Psychologie	1889
Société française d'Hygiene	1877
Société d'Encouragement pour l'Industrie nationale	1801
Société des Ingenieurs civils de France	1848
Société des Agriculteurs de France	1868
Société nationale d'Agriculture de France	1761
Société nationale d'Acclimatation de France	1854
Musée Social	1896
Société d'Économie politique	1842
Société de Legislation comparée	1869
Société d'Économie social	1856
Société de Sociologie de Paris	1895
Société de Statistique de Paris	1860
Société d'Études économiques	1891
Société de Géographie	1821
Société de Géographie commerciale de Paris	1873
Société des Études coloniales et maritimes	1876
Société de Topographie de France	1876
Société d'Ethnographie	1859
Société française de Numismatique et d'Archéologie	1865
Société nationale des Antiquaires de France	1805
PROVINCIAL SOCIETIES	
Société des Lettres, Sciences et Arts des Alpes maritimes (Nice)	1861
Académie des Sciences, Lettres et Beaux-Arts (Marseilles)	1726
Société de Statistique (Marseilles)	1827
Académie nationale des Sciences, Arts, et Belles-Lettres (Cæn)	1652
Société antiquaire de Normandie (Cæn)	1813
Société linnéenne de Normandie (Cæn)	1823
Académie des Sciences, Arts, et Belles-Lettres (Dijon)	1725
Académie des Sciences, Belles-Lettres, et Arts (Besançon)	1752
Académie des Sciences, Inscriptions et Belles-Lettres (Toulouse)	1640
Société archeologique du Midi de la France (Toulouse)	1851
Académie nationale des Sciences, Belles-Lettres et Arts (Bordeaux)	1712
Société de Geographie commerciale (Bordeaux)	1874
Société linnéenne (Bordeaux)	1818
Société de Statistique, des Sciences naturelles, et des Arts industriels de Isère (Grenoble)	1838
Société académique de Nantes et de la Loire-Inférieure (Nantes)	1798
Société d'Agriculture, Belles-Lettres, Sciences et Arts (Orleans)	1809
Société des Sciences, Agriculture et Arts (Lille)	1802
Académie des Sciences, Belles-Lettres et Arts (Lyons)	1700
Société d'Agriculture, Sciences et Industrie (Lyons)	1761

Germany. — The development of scientific and learned societies in Germany was due on the whole to foreign influences. The earliest of these was modeled probably on the Italian academies. This was the *Academia naturæ curiosorum* established by Dr. Bausch in Vienna in 1652. Its title was changed in honor of Leopold I and Charles VII to Die Kaiserlich-Leopoldinisch-Carolinische deutsche Akademie der Naturforscher. For many years this remained the only society of its kind in German-speaking Europe. It is still in existence and has its seat at Halle. The Akademie der Wissenschaften, which represents the best of German scholarship and research, was founded as the Société des Sciences in 1700 by Frederick I on the suggestion of Leibnitz, who became its first president. The formal opening did not take place until 1711. Its existence, owing to the refusal of supplies by its royal patron, was precarious until its refoundation in 1744 by Frederick the Great as the Académie des Sciences et Belles-Lettres de Prusse. Maupertuis became president in 1746. After a period of decline under Frederick William II it rapidly recovered, and its position as one of the first societies of its kind in the world was soon assured. Its work is divided into two classes, physical-mathematical, and philosophical-historical. Its members are divided into ordinary, honorary, and corresponding. It receives a large annual subsidy from the state and owns much property, which came into its possession under Frederick the Great. Its most important contribution has been in the field of history. The publications of the Academy consist of *Abhandlungen* and *Monatsberichte*. Unlike Paris and London, Berlin is by no means the intellectual center of Germany. Hence many important societies are found throughout the country, some at the seats of universities, others in the capitals of the federal states. Enjoying in the early years of its history almost as great a reputation as the Academy in Berlin, the Gesellschaft der Wissenschaften at Göttingen has made valuable contributions in the field of pure science. Founded in 1751, it was definitely organized in 1770 and now consists of two classes, mathematical-physical and philological-historical. It publishes *Abhandlungen*, *Nachrichten*, and the famous *Göttingische Gelehrte Anzeigen*. The Königliche Bayerische Akademie der Wissenschaften, founded in 1759, originally for historical study only, now takes general knowledge for its field. Its work is divided into three classes: philosophical-philological, mathematical-physical, and historical. While its best-known work has been in history (*Monumenta Boica*), the Academy is at present responsible for a scientific investigation of the kingdom and a Commission for the International Survey. While not itself a scientific society, the Fürstliche Jablonowskische Gesellschaft der Wissenschaften, which was founded in 1771 at Leipzig and offers prizes for and publishes work in history, antiquities, political economy, mathematics, and sciences, deserves a place here. It is divided into three classes, linguistic-philological, historical-economic, and scientific-mathematical, each of which offers an annual prize of $300 for a treatise on a prescribed subject. The Königliche Sächsische-Gesellschaft der Wissenschaften was founded in 1846 for the study of philology, history, mathematics, and natural sciences, which are now grouped into two classes. The society receives an annual subsidy and publishes *Abhandlungen* and *Berichte*. The Gesellschaft deutsche Naturforscher und Arzte, which also has its seat at Leipzig, deserves mention as probably the earliest of the migratory societies in Europe. It was founded in 1822 by Humboldt, and the first national congress was held at Leipzig. Historically this society was the immediate predecessor and model of the British Association.

It would be impossible in so brief an account to do more than give a list of the more representative societies in the larger towns. But it must be understood that there are in Germany very few places of any size which do not possess a local scientific society, for nowhere is the instinct of association stronger than in this country.

	Date of Foundation
Berlin: —	
Archäologiche Gesellschaft	1842
Vereinigung von Freunden der Astronomie und Kosmischen Physik	1891
Deutsche Botanische Gesellschaft	1882
Deutsche Bunsen Gesellschaft für angewandte Physik-Chemie	1894
Deutsche Chemische Gesellschaft	1867
Verein Chemische Reichsanstalt	1908
Deutsche Gesellschaft für Chirurgie	1872
Elektroteknisches Verein	1879
Deutsche Entomologische Gesellschaft	1881
Gesellschaft für Erdkunde	1828
Deutscher Geographentag	1881
Deutsche Geologische Gesellschaft	1848
Berliner Mathematische Gesellschaft	1901
Berliner Medizinische Gesellschaft	1860
Deutsche Meteorologische Gesellschaft	1883
Gesellschaft Naturforschender Freunde	1773
Numismatische Gesellschaft	1843
Deutsche Ornithologische Gesellschaft	1880
Deutsche Physikalische Gesellschaft	1845
Physiologische Gesellschaft	1875
Gesellschaft für experimentelle Psychologie	1904
Deutsche Gesellschaft für Soziologie	1909
Verein für Volkskunde	1890
Bonn: —	
Rheinische Gesellschaft für Wissenschaftliche Forschung	1911
Naturhistorischer Verein der preussischen Rheinlande und Westfalens	1843
Danzig: —	
Westpreussischer Botanisch-zoologischer Verein	1878
Naturforschende Gesellschaft	1743
Dresden: —	
Verein für Erdkunde zu Dresden	1863
Königlich Sächsische Gesellschaft für Botanik und Gartenban	1826
Gesellschaft für Natur- und Heilkunde	1819
Naturwissenschaftliche Gesellschaft, Iris	1835
Numismatische Verein zu Dresden	1908
Verein für Sächsische Volkskunde	1897
Erlangen: —	
Physikalisch-Medizinische Sozietät	1808
Frankfort a. M.: —	
Senckenbergische Naturforschende Gesellschaft	1817
Verein für Geographie und Statistik	1836
Geologie Vereinigung	1910
Frankfurter Numismatische Gesellschaft	1906
Physikalischer Verein	1814
Verein für Rheinische und Westfälische Volkskunde	1904
Freiburg i. B.: —	
Medizinische Gesellschaft	1910
Naturforschende Gesellschaft	1826
Giessen: —	
Oberhessische Gesellschaft für Natur- und Heilkunde	1833
Gesellschaft für Erd- und Völkerkunde	1896
Greifswald: —	
Geographische Gesellschaft	1882
Naturwissenschaftlicher Verein für Neuvorpommern und Rügen	1868
Halle: —	
Sächsisch-Thüringischer Verein für Erdkunde in Halle a. S.	1873
Naturforschende Gesellschaft	1779
Naturwissenschaftlicher Verein für Sachsen und Thüringen zu Halle a. S.	1848
Hamburg: —	
Deutsche Gesellschaft für Anthropologie, Ethnologie und Urgeschichte	1870
Deutsche Gesellschaft für Geschichte der Medizin und der Naturwissenschaften	1901
Geographische Gesellschaft	1873
Naturwissenschaftlicher Verein	1837
Heidelberg: —	
Heidelberg Akademie der Wissenschaften, Stiftung Heinrich Lanz	1909
Naturhistorisch-Medizinischer Verein	1886
Jena: —	
Geographische Gesellschaft für Thüringen	1882
Medizinisch-naturwissenschaftliche Gesellschaft	1854
Deutsche Mineralogische Gesellschaft	1908
Jenaische Gesellschaft für Mineralogie und Geologie	1909
Kiel: —	
Anthropologischer Verein in Schleswig-Holstein	1877
Verein zur Pflege der Natur- und Landeskunde	1890
Naturwissenschaftlicher Verein für Schleswig-Holstein	1855
Königsberg: —	
Physikalisch-ökonomische Gesellschaft	1790
Leipzig: —	
Astronomische Gesellschaft	1863
Verein deutscher Chemiker	1888
Verein für Erdkunde zu Leipzig	1861
Deutsche Mathematiker Vereinigung	1891
Medizinische Gesellschaft	1829
Verein für Sozialpolitik	1872
Marburg: —	
Gesellschaft zur Beförderung der gesamten Naturwissenschaften	1816
Munich: —	
Münchener Gesellschaft für Anthropologie, Ethnologie und Urgeschichte	1870
Geographische Gesellschaft	1869
Münchener Gynäkologie Gesellschaft	1884
Gesellschaft für Morphologie und Physiologie	1875
Bayerische Numismatische Gesellschaft	1881
Bayerische Botanische Gesellschaft zur Erforschung der heimischen Flora	1890
Rostock: —	
Verein der Freunde der Naturgeschichte in Mecklenburg	1847
Naturforschende Gesellschaft	1882
Strassburg: —	
Wissenschaftliche Gesellschaft in Strassburg	1906
Medizinisch-naturwissenschaftlicher Verein	1873
Stuttgart: —	
Württembergischer Anthropologischer Verein	1871
Verein für vaterlandische Naturkunde in Württemberg	1844

International Congresses. — Finally, a brief list is here given of the international associations and congresses which have been established to unite the scientists and students throughout the world. These groups represent the culmination of the coöperative spirit which has led to the establishment of scientific societies. (See, further, INTERNATIONALISM.)

	DATE OF FOUNDATION
Association Internationale pour Progrés des Sciences sociales (Brussels)	1853
International Meteorological Congress (Brussels)	1853
Congrès International de Statistique (Brussels)	1853
Société Internationale des Études pratiques d'Economie sociale (Paris)	1856
Congrès International d'Archéologie et d'Anthropologie préhistorique (Spezzia)	1863
International Astronomical Congress (Heidelberg)	1863
Congrès International d'Horticulture (Brussels)	1864
Congrès International de Botanique (Amsterdam)	1865
Congrès Médical International (Paris)	1867
Congrès International pour le Progrés des Sciences géographique (Antwerp)	1871
Congrès International des Orientalistes (Paris)	1873
Alliance Scientifique Universelle (Paris)	1876
International Conference of Librarians (London)	1877
International Congress of Geology (Bologna)	1878
International Electrical Congress (Paris)	1881
Société Internationale pour Études des Questions d'Assistance (Paris)	1889
Institut International de Sociologie (Paris)	1893
Internationale Association der Akademien (Wiesbaden)	1899
Internationale Vereinegung für Krebsforschung (Berlin)	1903
Internationale Vereinegung für Rechts und Wirthschaftsphilosophie (Berlin)	1909
Internationale Vereinigung der Chemischen Gesellschaften (Berlin)	1911

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See ACADEMY; AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE; AMERICAN LYCEUM ASSOCIATION; AMERICAN PHILOSOPHICAL SOCIETY; CARNEGIE INSTITUTION; INTERNATIONAL CONGRESSES; INSTITUTE, FRENCH; SMITHSONIAN INSTITUTION, etc.

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SCIENTIFIC TESTS. — A distinction may be drawn between the ordinary educational test, such as written examinations, and the definite measurements of mental abilities which are undertaken for the more accurate determination of native ability and the effects of educational processes.

See TESTS.

SCOLIOSIS. — See CRIPPLED CHILDREN; SPINE, CURVATURE OF THE.

SCOTCH-IRISH. — See CALVINISM AND EDUCATION; COLONIAL PERIOD IN AMERICAN EDUCATION; PENNSYLVANIA, EDUCATION IN.

SCOTLAND, EDUCATION IN. — In recent years considerable progress has been made in the organization and unification of education in Scotland, and the country may now be said to possess a well-organized system of primary, secondary, higher, and technical education. Though by no means so highly centralized as in France or Germany, the present system is a great advance upon what formerly obtained. The scheme as a whole is distinguished by its continuity, its carefully defined grades, and its recognized connecting links. Every parish is well provided with primary schools; secondary education is concentrated in natural centers, and at the same time the interests of pupils in outlying districts are safeguarded; universities and technical colleges are well distributed. The administration of Scottish education is an affair partly of the state and partly of local *ad hoc* bodies. The state subsidizes public education of all grades and thereby exercises, either directly or indirectly, an influence over it. As regards primary, secondary, and technical education, this influence, working through the Scotch Education Department, is very powerful. On the other hand, the universities are subject to no such close supervision or control, but possess a large amount of freedom and independence which they jealously guard. Adequate local financial support, whatever form it may take, is an invariable prerequisite to state aid. In the case of primary and secondary education this may mean, and usually does mean, the imposition of a local rate, but no local rate may be levied for university education. As distinct from England, the people are largely of one religious belief, Presbyterianism, and hence comparatively free from sectarian differences. Church superintendence of public education, however, so prominent in the past, was finally abolished in 1872.

History. — Extant documents afford ample evidence of the existence of schools in Scotland from the beginning of the twelfth century. Such schools were part of an ecclesiastical organization and probably differed little, if any, from contemporary schools in continental Europe. At the Reformation (1560) the new church took over the superintendence of education. John Knox (*q.v.*) and his colleagues outlined in the *First Book of Discipline* a comprehensive scheme of education which was to be financed from the patrimony of the old church. The rejection of these proposals deferred the realization of a national system of education for more than three centuries. The church long maintained its authority over education. Its claim to jurisdiction over schools and colleges was based upon the act of 1567, confirmed by Parliament in 1581, and again in 1592. During the seventeenth and eighteenth centuries frequent references to this right are to be found in the acts of the General Assembly and the records of kirk sessions. From early times, even before the Reformation, town councils claimed, usually with success, a right to the patronage of burgh or grammar schools; but church "visitations" were quite common down to 1872. On the other hand, the jurisdiction of the church over the parish school was never questioned, and when this school was established by law in 1616 and 1633, the church was associated in its future management.

Notwithstanding the parliamentary acts of 1646 and 1696 the parish school proved to be inadequate to meet growing demands in education, and in consequence a subsidiary system of voluntary denominational schools was grafted upon it in the eighteenth century. The statutory system was managed locally and maintained by local assessment; the voluntary, by various religious bodies and financed largely by subscription. When the practice of giving parliamentary grants to education was instituted (1833) and the Education Department was created (1839) to administer them, both systems to a limited extent received a share of these grants; this continued until the passing of the act of 1872, when the Scotch Education Department was created and the school-board system inaugurated. The parish school has had a deep influence upon national life in Scotland. The parochial schoolmaster was often a man of university attainments, who, in addition to teaching primary subjects, and indeed often to their neglect, instructed his more capable pupils in the higher subjects required for entrance to the university. Thus the parish school and similar schools were immediate avenues to the university. As a tradition this has left an indelible mark upon subsequent educational developments. At the time, however, it contributed to make the standard of the Arts course of the university little higher than that of a good secondary school of the present day. By a clause in the act of 1872 the right to give higher instruction was specially conserved to the parish school, and the problem in succeeding years was how to give effective expression to it. After several experimental stages, an admirable solution was found in the creation of the higher grade school (1899), which may be looked upon as the descendant of the best of the old parish schools. This school, of course, was under the management of the school board.

Curiously enough, except as regards church superintendence, the burgh school practically stood outside parliamentary legislation. The well-known act of 1496 by which the sons of barons and freeholders were to be kept at the grammar school from the age of eight or nine until they were "competentlie foundit" and had "perfite latyne" is of historic interest, but it does not appear that it was at all effective. Throughout the sixteenth and seventeenth centuries the teaching of Latin was the chief function of the grammar school. In the eighteenth century a new type of school under the name of academy (*q.v.*) came into existence for the purpose of providing an education not entirely classical, and in the first half of the next century a number of subscription or endowed schools, as well as private schools, were founded. While the burgh school, the lineal descendant of schools which existed in the twelfth century, was administered by the town council, which maintained the school building, and, in general, provided a small salary for the teacher, the others, as a rule, were controlled by managers appointed by the subscribers. The character, work, and organization of these schools varied greatly; there was no common aim or standard, and the curricula often overlapped that of the university. The report of the Argyll commission (1864) contains a mass of interesting facts regarding them. It may be added that a common feature then, as now, was coeducation. In 1872 was passed the Education (Scotland) Act which, though supplemented by the acts of 1878, 1901, and 1908, is the basis of the present system. Burgh schools, providing an education not consisting chiefly in elementary instruction in reading, writing, and arithmetic, passed immediately under the management of school boards and received the name of higher class public schools. Other schools, providing higher education, either elected to come under the same management and received the same name, or remained under their former managers and took the title of higher class schools.

It should be stated that the act of 1872 had no relation to universities, secondary education committees, or state aid to secondary schools. It would be both interesting and instructive to trace recent developments in connection with the two latter, but space will not permit of it.

Administration. — Public education in Scottish schools is administered by (*a*) the Scotch Education Department, (*b*) school boards or other local authorities, and (*c*) secondary education committees.

The Scotch Education Department (the "Department"), which consists of "The Lords of any Committee of the Privy Council appointed by her Majesty on Education in Scotland," is the central authority. The Lord President of the Council is *ex officio* president of this committee, but as a guarantee that proper attention shall be given to the special requirements of Scotland, the secretary for Scotland is vice president of the committee, and by the Secretary for Scotland Act, 1885, is responsible to parliament for the administration of the Department. Attached to it is a permanent secretary, assisted by a staff of officials. The main duties of the Department are (1) to frame a code of regulations (the Code), under which the annual grant for day schools is distributed, and to administer the grant; (2) to frame the continuation class code and administer the grant; (3) to regulate and administer the grants to secondary schools; (4) to distribute the Education (Scotland) Fund, and superintend the administration of the district funds by the district committees; (5) to administer the Scottish teachers' superannuation fund; (6) to maintain a system of inspection over schools receiving grants, and to regulate and conduct the leaving certificate examination; (7) to regulate the training and certification of teachers; and (8) to submit annually to parliament estimates of the annual grant required and a report of its own proceedings under the education acts. To assist the Department in its work of supervision, the country is divided into four "divisions," to each of which is attached a chief inspector and staff. In all there are twenty-eight inspectors, nine junior inspectors, and thirty subinspectors.

The school board is the statutory local authority. The country is mapped out into 971 education areas, corresponding, in general, to the existing burghs and parishes, and for each of these a school board is elected triennially by the local ratepayers. While these boards may, and to a certain extent do, make provision for secondary and technical education, their primary duties consist in providing and maintaining efficient school accommodation and instruction in their own areas for all children between the ages of five and fourteen, within which limits attendance at school is compulsory. School boards may, however, grant exemption to pupils between the ages of twelve and fourteen, in which case they have the power of demanding attendance from them at continuation or other classes up to the age of sixteen. They may charge school fees, which, if the school receives a share of the annual grant, must not exceed a certain amount; in general, however, education is free up to the age of fourteen. As managers they are responsible for the school time-table and determine the character of the religious instruction, if any, to be given, though they cannot compel attendance at it. They appoint the teachers, remunerate them, and, subject to an appeal to the Department, may dismiss them. Further, they may provide for the medical inspection of children, make provision for the preparation and supply of meals for pupils and give clothing and food in necessitous cases; provide schoolbooks and stationery free; defray the cost of conveying pupils to schools from outlying districts; and maintain any agency for collecting and distributing information regarding employment for children on leaving school.

To meet these expenses each school board is provided with a school fund into which are paid all parliamentary grants, monies raised by loan, school fees (if any), and other sums received for the purposes of the fund. On requisition being made to the local parochial board, any deficiency in any year is met by a subvention from the local rates. For providing equipment of a more permanent character the school board, on the approval of the Department, may raise loans, the repayment of which may be spread over a number of years. An annual account of its receipts and expenditure is submitted to the audit of the Department's accountant, and illegal payments may be disallowed.

Although the school boards are the statutory local authorities, the managers of voluntary schools in receipt of parliamentary grants, and the managers of endowed secondary schools and similar schools are the local authorities for their own schools and manage them independently of the local school board, but receive no financial assistance from the local rates. Private schools are comparatively few in number, but may be entered, inspected, and examined by fit and proper persons appointed by the relative school board and the Department. In practice, however, they are subject to little or no interference.

While the central authority supervises the distribution of grants, and by its codes and minutes — both of which have to be laid upon the tables of the two Houses of Parliament before becoming law — makes regulations for safeguarding public interests in the expenditure of imperial funds on education, the local authority is allowed a reasonably fair amount of liberty in the management of its schools.

The secondary education committee, created in 1892, is a district committee. For certain educational purposes the thirty-three counties, the five chief burghs, and one large parish, are constituted educational districts and each provided with a committee. Each of these committees, the constitutions of which are remodeled from time to time, consists of members elected or nominated by local and district public bodies, directly or indirectly interested in education, and an inspector or other official nominated by the Department as its assessor. Additional members specially interested in education may be coöpted by the committees themselves. Their functions, which relate not merely to secondary education but to all forms of education beyond the resources of individual school boards, are concerned mainly with the distribution of the district education funds, and are best considered in connection with the Education (Scotland) Fund (1908). This fund, consolidating, various parliamentary grants for education, is distributed in the following manner. Educational objects of national importance, which cannot properly be put upon the rates of any one district, have first consideration. Thus the cost of inspecting secondary schools and conducting the leaving certificate examination is a first charge upon the fund, as well as grants to universities, central institutions, and provincial committees, and grants in aid of retiring allowances to teachers. The balance is then formed into district funds, one for each district of a secondary education committee, in accordance with a scheme of allocation prepared by the Department, which takes into account both the relative cost of education and the relative wealth or poverty of each district. A first charge upon each district fund is expenditure which is not properly referable to any one school board area — such as payments to local authorities in respect of the higher education provided by them for pupils outside their educational areas; payments to school boards when the charge upon the local rates in respect of higher instruction exceeds a certain sum per pound; and payments for half the cost of the medical inspection provided by school boards. In addition, payments may be made for the provision of a district bursary scheme to enable pupils to receive higher instruction at suitable centers, and for traveling expenses and maintenance allowances of teachers attending special courses of instruction at some center. Each secondary education committee annually prepares an estimate of its proposed expenditure, and submits it for the approval of the Department. Whatever balance remains in any year is distributed among the local authorities of the district as an addition to the fee grant.

Organization. — In 1906 the Department adopted a new classification of schools — primary, intermediate, secondary — based upon distinctions in curricula. While this nomenclature is very convenient and will doubtless supersede the older one, the former distinctions still hold in respect of grants. Higher grade schools receive grants under the code; higher class schools, public or otherwise, receive grants under regulations specially applicable to secondary schools.

Primary Education. — The primary school provides for the instruction of pupils up to the age of fourteen. The normal organization to the age of twelve is infant division (5–7), junior division (7–10), and senior division (10–12). While the main subjects of instruction are reading, writing, and arithmetic, provision is made for teaching certain auxiliary subjects — history, geography, physical exercises, singing, drawing, nature knowledge, and others. Individual examination in general has been abolished; the business of the inspector is to animadvert on deficiencies in the curriculum and on grave faults in method. The successful termination of this course is attested by the qualifying examination, in which the judgment of the teacher is the main determining factor. Beyond this the work bifurcates into a supplementary course (continuation of primary), or the intermediate course (first stage of secondary). The former is a specialized course — commercial, industrial, rural, or domestic, — designed for those who intend to leave school at or about the age of fourteen, and is crowned by the merit certificate. Such courses may or may not be provided in the same school as the primary instruction proper. In towns there is a tendency to set apart schools exclusively for this work.

Intermediate Education. — An intermediate course extends over at least three years (12–15) beyond the stage of the qualifying examination. It is prescribed by the Department and is intended to provide a broad general education in English, history, geography, mathematics (including arithmetic), at least one language other than English, science, and drawing. A school with such a course ranks as an intermediate school. In general a higher grade school falls into this group. On the satisfactory completion of the course an intermediate certificate is granted. This certificate, or its equivalent, is the prerequisite to a leaving certificate.

Secondary Education. — A school providing a course of secondary education of at least five years' duration beyond the qualifying examination stage is termed a secondary school. In general, higher class schools of both types form this group, although some higher grade schools are also included. The five years' course is divided into the intermediate course (three years) and the secondary course (two or more years). The character of the former has been described above; the latter is determined by the local managers with the approval of the Department. If adequate provision can be made for them, several courses may be offered, and to a certain extent specialization on definite lines — classical, scientific, modern languages, commercial — may be permitted, always provided that English, one foreign language, and either mathematics or science are included in each group, and have been carried to what is known as the higher standard. The granting of a leaving certificate testifies to the satisfactory completion of any one secondary course.

This organization has been effected by the Department in a series of steps, mainly in virtue of its control of the leaving certificate examination and of the parliamentary grants given to secondary education. Schools which receive grants under the Code, such as primary schools and higher grade schools, have from the first been directly under the control of the Department; but higher class schools were on a different footing. Beginning in 1892, successive grants have been made to secondary education on certain conditions which in practice mean that schools sharing in these grants, and practically all higher class schools do participate in them, come under the control of the Department. Further, the leaving certificate examination, instituted by the Department in 1888, is accepted by almost all intermediate and secondary schools, and the control of this examination practically means the control of the curriculum. At first the examination was one of individual subjects; but in recent years it has developed more on the lines of the *Abiturientenexamen*, in so far as it is a test of the satisfactory completion of a course of study. The intermediate examination is a written and oral examination in the subjects of the intermediate course. Due weight is given to the teachers' opinions, and deficiencies in individual subjects may be compensated for by excellence in others. The leaving certificate is granted on principles similar to those adopted for the intermediate. Provided the leaving certificate testifies to the satisfactory conclusion of a course which includes the subjects demanded by the entrance examination of the university, it is accepted by the university as giving immediate and unreserved entrance to its courses, and to this extent the work of the secondary school is articulated to that of the university.

Training of Teachers. — A new system of training teachers was adopted in 1905–1906 which has practically superseded the former system of pupil teachers and denominational training colleges. A provincial committee for the training of teachers has been established in each of the four university centers with a "province," embracing several counties, assigned to it. Its members comprise representatives of educational bodies — universities, colleges, secondary education committees, training colleges (if transferred to the committee), as well as coöpted teachers, and a chief inspector as the Department's assessor. Its functions are to provide for the suitable training of teachers, including teachers of higher subjects in secondary schools as well as teachers of special subjects, and to establish courses for the further instruction of teachers in actual service. Each committee has an executive officer and a staff of instructors, and arranges its own scheme of courses. The expenditure, which is met out of parliamentary grants, is under the close supervision of the Department. Maintenance allowances may be made by the committee to its students, and hostels or residential institutions established and subsidized.

The course of training is taken in two stages — junior student and senior student. A candidate for a junior studentship must have gained an intermediate certificate, and been nominated by a secondary education committee, by whom a maintenance allowance may be granted. As the output of trained teachers is best controlled at its source, the number of nominations to junior studentships is regulated by the Department. Each secondary education committee has the option of nominating a certain number, the allocation being based mainly on the relative population of the districts. A three-years' course of training in certain subjects of general education, defined by the Department, and in the art of teaching follows. This course is given in any one of a number of secondary schools selected for the purpose, and known as junior student centers. The satisfactory completion of the course is attested by the junior student certificate. The student may then enroll under a provincial committee as a senior student for a two-years' course as a minimum, in which prominence is given to the purely professional part of the training. While the attainment of the general certificate is the primary object of the senior student, those students who on entering possess a leaving certificate, or show aptitude for special subjects, as attested by a junior student certificate or its equivalent, may be allowed to attend any class at a university or central institution, their instruction and training being based on a well-defined curriculum which may extend over three or four years. Thus a capable student may obtain a university degree or college diploma in addition to the teacher's general certificate. Thereafter two years of satisfactory service in an approved school are required before the permanent certificate is issued.

Teachers of higher subjects and specialists must acquire an extended knowledge of the branch of study they propose to teach, and undergo at least one year's professional training, with special reference to that particular branch, under one of the provincial committees. A subsequent probationary year in some approved school is enjoined upon them before they are finally recognized as fully certificated.

Statistics (1911). — Census population, 4,739,445. *Annual grant schools*: total number of day schools (primary and higher grade), 3369; accommodation provided, 1,077,289; average on registers during the year, 847,984; average attendance, 755,988; average on registers at end of year, 845,055; certificated teachers — male, 5189 (1921 graduates), female, 13,680 (857 graduates); assistant teachers — male, 122, female, 1060; pupil teachers — male, 15, female, 259; average salaries of certificated teachers — headmasters, £188 5*d.*; assistant masters, £136 5*s.* 4*d.*; headmistresses, £95; assistant mistresses, £81 12*s.* 4*d.*; expenditure per scholar in average attendance, £3 13*s.* 2¼*d.* (1910) *Higher grade schools* (supplementary, but included above): number, 196; accommodation, 40,505; average on registers, 26,349; average attendance, 24,083. *Higher class schools* receiving grants under regulations for secondary schools: number, 57; average attendance, 19,965; teachers — permanent, 1134, visiting, 225; total grant, £38,170. Total number of higher class schools inspected by the Department, 104. *Examinations* (number of passes): qualifying, 60,683; merit, 15,946; intermediate, 4797; leaving, 1248. *Training of teachers*: junior students, 3833 in 115 centers; senior students, 2917. Education (Scotland) Fund, £493,888. Aggregate sum from *school rates*, £1,567,975, representing 44.5 per cent of aggregate income of school boards, excluding loans for capital charges.

Universities. — *History.* — Scotland is well equipped with universities, three of which — St. Andrews, Glasgow, and Aberdeen — were founded in the fifteenth century. Soon after their erection they were provided with colleges, founded as endowments for teachers in the universities — particularly of theology — rather than as endowments for students. From the first, therefore, college teachers were teachers or professors in the university. Gradually the residential college system decayed, although a relic of it was preserved in St. Andrews until 1820. In a restricted sense St. Andrews still retains the ancient college system, since, subject to appeal, the discipline is delegated by the senatus to each of the two colleges which, as committees of the senatus, meet separately. In Aberdeen and Glasgow, on the other hand, the colleges are completely merged in the universities. These facts had important consequences upon the development of university life in Scotland, not the least being that the expenses of a university education have always been moderate. In general, too, little supervision is exercised by the university over its students outside the lecture room. Medieval customs prevail in the election of the rector by the whole body of students and their voting in "nations" (Glasgow and Aberdeen), as well as in the continuance of the rector elected for a short period, side by side with the chancellor, the head of the university, elected for life. For many years the curriculum was largely medieval in scope, and a system whereby the regent carried his students through the whole course to graduation was in operation. This "ambulatory" regenting system was, indeed, retained in King's College, Aberdeen, until the end of the eighteenth century; only gradually were the professors limited to certain subjects. In consequence the education provided was general rather than special, and the university for long did the work of the upper classes of a good secondary school. In the early years of the last century it was not uncommon to find students enrolling at the age of twelve and even under. No compulsory entrance examination was instituted until 1892. Neither was a compulsory curriculum insisted upon nor graduation considered essential. In 1826, after an interval of 130 years since the previous university commission, an era of royal commissions on universities set in. The reports are interesting, the one beginning with 1830 containing a mass of historical matter relative to the four universities. But reform did not come until the Universities (Scotland) Act of 1858, when curricula were readjusted, new chairs instituted, and King's College and Marischal College united in the University of Aberdeen. But, more than this, the act created a new and, as far as possible, uniform administration for each university. The conduct of affairs was intrusted to three bodies: the senatus academicus with the management of the ordinary business; the university court as the court of appeal; and the general council to bring the university into touch with outside public opinion. A second Universities (Scotland) Act was passed in 1889, under the provisions of which the universities are still conducted. By this act a permanent committee, the Scottish universities committee of the privy council, was created and a temporary executive commission appointed to draft ordinances subject to the veto of the Queen-in-council, and to affiliate University College, Dundee, to, and make it form part of, St. Andrews University. After protracted litigation the latter was effected in 1897.

Administration. — Each university is practically autonomous, although there is a restriction in the matter of making new ordinances or modifying existing ones. As it was the intention of the legislature to make the Scottish universities as far as possible uniform, any new ordinance, before becoming operative, must be communicated to the other universities who are entitled to appeal against it. In such a case the matter is brought before the Scottish universities committee. In the recent Arts ordinances, however, there was no appeal to this committee, and the assent of the King-in-council was merely formal. In ordinary circumstances, therefore, this committee has practically little to do, and, as it has no public money to administer, it has no financial control. A species of control to which the universities are subjected, none the less real for having no legal sanction, is that exercised by the Treasury and the Carnegie Trust. Indirectly, of course, the Department, in its control of secondary education and of the leaving certificate examination, has considerable influence upon the universities; the raising of the standard of secondary education has not been without important effects upon the standard of work in them.

Within the university itself the governing bodies are the university court, the senatus, and the general council, the broad functions of which have been indicated above. The university court, the supreme governing body, is a body corporate with perpetual succession and a common seal, and charged with the possession and administration of the whole revenue and property of the university. It consists of the rector, who presides, the principal or principals, municipal representatives, assessors comprising a nominee of the chancellor and the rector, respectively, and representatives from the general council and the senatus academicus. It is the court of appeal from the senatus; effects improvement in the internal arrangements of the university; and requires due attention on the part of the professors to their duties — which it can define. Furthermore, it can deprive a professor of his office, subject to the approval of the

King-in-council; it appoints examiners and lecturers, and professors whose chairs are in the patronage of the university; it can found new professorships with the approval of the Scottish universities committee; it regulates the fees in the classes, and it may grant recognition to the teaching of extra-mural colleges for graduation purposes, and, subject to the approval of the King-in-council, it may make ordinances. The senatus academicus, consisting of the principal and professors of the university, the former presiding, regulates and superintends the teaching and discipline of the university, and takes part in the superintendence of university libraries and museums. The general council consists of the chancellor (whom it elects and who presides), the members of the university court, the professors, and the graduates. Two statutory meetings are held yearly, and the business of the council is to take into consideration questions affecting the well-being and prosperity of the university, and to make representations if necessary to the university court. Two members of parliament are returned by the universities, and are elected by members of this council — Edinburgh and St. Andrews jointly electing one, and Glasgow and Aberdeen, the other. Each university possesses a students' representative council, the constitution of which is subject to the approval of the university court. This council is entitled to petition the senatus, on matters affecting teaching and discipline, and the university court.

Organization. — In their original constitutions the Scottish universities followed continental models, the courses of study being arranged in the four faculties of arts or philosophy, law, medicine, and divinity or theology, which, with the addition of the faculty of science, and, in Edinburgh, the faculty of music (1893), still exist. Entrance upon a course of study in the faculty of arts, of science, or of medicine is granted on passing the relative preliminary examination, which varies somewhat for each faculty and which is regulated and conducted by a joint board of examiners appointed by the university courts. This board, consisting of eight professors or lecturers and eight additional examiners, sits for one year at each university in rotation, the principal of the university where the board meets being *ex officio* chairman for the year. Passes in various other examinations, including the leaving certificate examination, may be accepted *pro tanto* in lieu of passes in the preliminary examination.

The main function of the faculty of arts in the past has been to give students a liberal education in general subjects, the remaining faculties providing professional training. Under the new Arts ordinances it seems not unlikely that this traditional function will be largely modified, and possibly the Arts curriculum may develop into a specialized course — largely for teachers. Two lines of study are offered — one leading to the ordinary degree (M.A.), the others to the honois degree (M.A.). Three academical years are required for the former — an academical year consisting of at least twenty-five weeks divided into three terms, autumn, spring, summer — and usually four for the latter. For the ordinary degree a large amount of option in the selection of subjects is permitted and to a certain extent specializing is possible. The number of subjects is five as a minimum, of which two must be studied for two academical years. The degree examinations in the latter are on a higher standard than those of the other three subjects. Certain concessions are allowed in respect of cognate subjects. Beyond the M.A. are the degrees of doctor of philosophy (D.Phil.) and doctor of letters (D.Litt.). In the faculty of science, degree courses are offered in various branches — pure science, engineering, agriculture, forestry, and public health — but not in each university. Two degrees are offered, bachelor of science (B.Sc.) and doctor of science (D.Sc.). As some of the subjects for the science degree may be taken as part of the Arts course, it is not unusual for a student to obtain the ordinary M.A. and B.Sc. in practically the same time as would be occupied in taking an honors M.A. degree.

In the faculty of medicine the degree of bachelor of medicine (M.B.) and bachelor of surgery (Ch.B.) must be taken conjointly; one is not conferred without the other, and the minimum time required for the course is five years. Two higher degrees are offered, the doctor of medicine (M.D.) and the master of surgery (Ch.M.). In the faculty of law there are two degree courses: one of two years' duration leading to the degree of bachelor of law (B.L.); the other for graduates in Arts only, covering three academical years and leading to the degree of bachelor of laws (LL.B.). In the faculty of divinity the degree of bachelor of divinity (B.D.) is open to graduates in Arts who have satisfactorily completed a two years' course in theology. Since this faculty in each of the universities is connected with the Established Church, it has been the practice, under certain restrictions, to admit to theological degrees those who, by reason of ecclesiastical differences, have attended recognized extra-mural colleges for courses of divinity. Scotland, it may be added, is well supplied with theological colleges; the United Free Church has training colleges for its clergy in Edinburgh, Glasgow, and Aberdeen; the Free Church, in Edinburgh; the Congregationalists and the Scottish Episcopalians, in Edinburgh; and the Roman Catholics, in Aberdeen. The degrees so far considered are obtained by examination, but in addition, the universities confer, *honoris causa*, the degrees of doctor of laws (LL.D.), doctor of divinity (D.D.), and doctor of music (Mus.D.).

Until 1892 Scottish universities could not admit women to academic instruction or graduation. Previous to this, various associations for the higher education of women had been advocating the opening of academic classes to women. In 1877 St. Andrews University instituted the L.L.A. examination. This was followed by the founding of Queen Margaret College, for the higher education of women, in Glasgow in 1883, which, with the passing of the ordinances of 1892 admitting women to the universities, became an organic part of the university.

The Scottish universities are not well endowed. Their funds are derived from bequests, endowments, fees, and grants from parliament and from the Carnegie Trust. For many years they have been assisted by grants direct from the treasury, the annual amount of which was increased to £42,000 in 1889. In 1892 an annual sum of £30,000 was added. The Secretary for Scotland may also consider applications from the university courts and make grants to them out of the Education (Scotland) Fund. A committee was recently appointed (1909) by the treasury to inquire into the financial position of the universities, with the result that an additional sum of £40,000 has been granted.

In 1901 Mr. Andrew Carnegie conveyed to trustees bonds to the value of $10,000,000, bearing interest at the rate of 5 per cent, and directed that one half of the net revenue should be applied to the expansion and development of Scottish universities, more especially with respect to the faculties of science and medicine, and to provision for the teaching of history, English literature, modern languages, economics, and subjects related to technical and commercial education. Extended facilities were also to be made for scientific study and research. The other half was to be devoted to the payment on certain conditions of the ordinary class fees of students of Scottish birth or extraction attending the university; extra-mural colleges and institutions, providing technical and commercial education up to university level, were not excluded from the benefits of the funds.

Statistics. — Matriculated students for winter session (1910–1911): St. Andrews, 561; Glasgow, 2705; Aberdeen, 930; Edinburgh, 3298. Carnegie Trust for period 1901–1908: post-graduate study and research, £40,353; grants to universities and extra-mural colleges, £246,088; payment of class fees, £298,686; number of beneficiaries — men, 6185; women, 2078.

Technical Colleges and Continuation Classes. — *History.* — Until the beginning of the present century there was little or no organized system of technical education in Scotland. In Glasgow a scheme of amalgamation of several existing technical institutions came to a head in 1886 when the Glasgow and West of Scotland Technical College was founded. In Edinburgh in the preceding year, with the Watt Institution and School of Arts as a nucleus, the Heriot-Watt College was projected. In Dundee a technical institute was erected in 1887. In addition to these a number of science and art classes, subsidized by the science and art grant, existed in various parts of the country. The Technical Schools (Scotland) Act of 1887, by which school boards were empowered to erect and maintain technical schools, met with practically no response. On the other hand, the town and county councils allotted a fair proportion of a grant, which had come under their administration in 1890, to technical education.

But the first real progress in the reorganization and extension of facilities for technical education began when the Scottish share of the science and art grant, hitherto administered by the Science and Art Department, came under the control of the Scotch Education Department (1897). Within a few years the system under which the grant had been administered was completely reorganized and placed upon a sound educational basis. A clear distinction was drawn between instruction in science and art as part of a general education and as applied to specific industries and employments. A new code of regulations for continuation classes was issued (1901) which, with a few subsequent modifications, broadly covers the elementary technical instruction now given in the country. The grants under this code are derived partly from the science and art grant and partly from the grant formerly given to continuation class instruction.

Administration. — The parliamentary grant for technical instruction is administered by the Department, which, in the continuation class code, or in special minutes applicable to certain central institutions, defines the conditions under which it is distributed. The Department also determines the amount of payments (if any) to be made from the Education (Scotland) Fund to central institutions. It is the duty of a school board to make suitable provision for the instruction of young people above the age of fourteen with reference to the crafts and industries practiced in its district; and in pursuance of this it can provide technical schools or institute technical classes, the management of which may be delegated to special committees comprising, among others, persons skilled in the industries and occupations to which the instruction in the classes has special relation. Under certain limitations the school board may also make by-laws enforcing attendance at a continuation school until the age of seventeen. In addition to the provision made by school boards, there are sixteen central institutions, with governing bodies or managers variously constituted but in general representative of local educational and industrial interests. The local authority, whether a school board or other body of managers, undertakes full financial responsibility irrespective of any grant which may be given, and only in exceptional cases is the grant greater than three fourths of the total expenditure recognized as legitimate by the Department. The remaining one fourth must be provided locally. While this is true in general, central institutions are treated somewhat differently from continuation classes. Grants to the latter depend mainly upon attendance, whereas grants to central institutions, when certain conditions laid down by the Department as to staff, curricula, and examinations for diplomas are complied with, depend mainly upon excess of current expenditure over income, and are usually sufficient to make good any deficiency.

To a certain extent, secondary education committees share in the administration of technical education. They have the power to give bursaries to students to attend central institutions for technical (including agricultural) education. They may also appoint organizers of elementary technical instruction, and provide special teachers to conduct district classes, all with due regard to coördination with central institutions.

Organization. — The scheme outlined in the code of regulations for continuation classes is the basis of the organization. This code groups the instruction in four divisions. Under the head of Division I are placed classes for the completion of a general elementary education, the work of which corresponds generally to the work in the supplementary courses of a primary school. Division II comprises classes for specialized instruction of an elementary nature, such as may be of use to pupils who are engaged in or preparing for any particular trade, occupation, or profession. They are open to all over sixteen years of age. Division III includes organized courses of systematic instruction, arranged with a view to fitting students for the intelligent practice of particular crafts, industries, or occupations. Such courses must, in general, extend over three years at least, and may be classified as commercial and literary, art and art crafts, engineering, naval architecture, navigation, architecture, building, and allied trades, textile industries, chemical industries, etc. A course is graded as preparatory, first year, second year, and so on, and the conditions of direct admission to each year are defined in relation to the existing courses in primary, intermediate, and secondary schools. Within the provinces of the central institutions, the various Division III courses are linked on to the central courses, and whenever the distance, transport, and other conditions are favorable, arrangements are made whereby the students shall continue their studies at the corresponding central institution. Elsewhere, if proper laboratory and other equipment is available, some one or more courses may be allowed in which, not infrequently, instruction of an advanced character is provided. Of the sixteen central institutions, three provide instruction in agriculture — Aberdeen and North of Scotland College of Agriculture, Edinburgh and East of Scotland College of Agriculture, and the West of Scotland Agricultural College. These colleges *inter alia* conduct day and evening classes, extension lectures, and experimental farms, and provide advisory departments. Each, too, offers a diploma course, and, in conjunction with the university, a course leading to the degree of B.Sc. in agriculture. The Technical Colleges of Aberdeen, Edinburgh, Dundee, and Glasgow offer advanced work in a great variety of industrial pursuits. In recent years extensive additions have been made to the Technical Colleges in Edinburgh and Glasgow, both of which are highly staffed and excellently equipped. Diploma courses are offered in both, the latter granting diplomas in civil engineering, mechanical engineering, electrical engineering, mining, naval architecture, chemistry, metallurgy, mathematics and physics, building, textile manufacture, and, in conjunction with the school of art, architecture. Parts of the work in the Technical Colleges of Glasgow and Edinburgh are recognized by the universities as qualifying for their B.Sc. degrees. Recently a new and well-planned Technical College has been erected in Dundee. Three central institutions in Edinburgh, Glasgow, and Aberdeen, respectively, are organized as colleges or schools of art, and provide full diploma courses. The Edinburgh College of Art is an extensive building of quite recent erection. Two central institutions, the Edinburgh Royal (Dick) Veterinary College and the Glasgow Veterinary College, make effective provision in their special branches of study. Colleges for domestic science exist in Edinburgh, Glasgow, and Aberdeen; while the Dunfermline College of Hygiene and Physical Training, the Glasgow Athenæum Commercial College, and the Leith Nautical College give adequate training in their respective departments. J. S.

Statistics (1909–1910). — Central Institutions: number of students — day, 4671; evening, 12,178; total grant from Department, £74,005. Continuation Classes: number of centers, 1055; number of individual pupils, Division I, 25,821; Division II, 76,967; Division III, 22,653; Division IV, 9902; grand total, 127,687; total grant from the Department, £110,100.

See England, Education in; Middle Ages, Education in; Knox, John; Reformation and Education; etc.

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SCROFULA. — See Tuberculosis.

SCULPTURE. — See Art Education.

SEAMANSHIP, THE TRAINING FOR. — Great Britain. — It was from the side of mathematics that the first instruction in subjects connected with seamanship came. In 1496 John Müller of Königsberg (Regiomontanus) printed at Venice a Latin epitome of the Μεγαλὴ Σύνταξις of Ptolemy, and published the first printed almanac. Martin Behaim, who had been trained mathematically by Müller, went to Portugal and traveled to the mouth of the Congo in 1484. He gave himself up to seamanship, and left behind him maps and a globe, on his death in 1506. He had shown how to use the astrolabe for taking the altitude of the sun. The Spaniards were the first to organize instruction in seamanship by the appointment of a cosmographer to the Council of the Indies, who not only was required to prepare maps and tables for navigation, but also to give to voyagers courses of instruction in arithmetic and astronomy, Euclid, and trigonometry, as well as in the use of the astrolabe and the globes and in the use of other astronomical instruments. This instruction was given in Seville, and led to the publication of naval textbooks, particularly that of Enciso as early as 1519. The Dutch followed the Spanish example, and trained their master mariners. Gerard Mercator and Abraham Ortelius produced wonderful maps, and Coignet wrote a textbook on the subject of navigation. English navigators used translations of the naval textbooks of other nations, chiefly those of Spain, until William Bourne in 1573 wrote one in English. Others followed quickly, *e.g.* Robert Tanner, in 1587, *A Sure Safety for Sailors*, and Thomas Blundeville, *A Briefe Description of universal mappes and cardes, and of their use; and also the use of Ptolemy his tables, etc.*, in 1584, and also his *Exercises*, containing six treatises "verie necessarie to be read and learned by all young Gentlemen that . . . are desirous to have knowledge as well in Cosmographie, Astronomie, and Geographie as well as in the Arte of Navigation," 1594 (also 1597, 1613, 1622, 1636). John Davis, the discoverer of Davis's Strait, wrote (in 1594) *The Seaman's Secrets.* Further reference books on navigation up to the middle of the seventeenth century are given in William London's (*q.v.*) *Catalogue of the most Vendible Books*, 1658–1660.

Richard Hakluyt (*q.v.*), preacher and sometime student of Christ Church, Oxford, who wrote the *Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation, etc.* in 1589, says in the Epistle Dedicatory to Walsingham: "When I was removed to Christ Church in Oxford, my exercises of duty first performed, by degrees I read over whatsoever printed or written discoveries and voyages I found extant either in the Greek, Latin, Italian, Spanish, Portugall, French or English languages, and in my public lectures *was the first* that produced and shewed both the old imperfectly composed, and the new lately reformed Maps, Globes, Spheres, and other instruments of this Art for demonstration in the common schools to the singular pleasure, and general contentment of my auditory." Hakluyt pleaded for the training of skillful seamen, a profession requiring, he suggests, the time of "two prenticeships." He continues: "I have greatly wished there were a lecture of Navigation read in this Citie (London), for the banishing of our former gross ignorance in Marine causes." He states that King Henry VIII, following the example of the Emperor Charles V, erected three gilds, one at Deptford, one at Kingston-upon-Hill, and the third at Newcastle-on-Tyne (in 1537) "for the increase of knowledge in his seamen," and he acknowledges the value of the mathematical lectures of Sir Thomas Gresham for "the advancement of Marine causes" (*q.v.*). It must be remembered that Hakluyt was of Dutch origin, but his appeal to Englishmen led in Queen Elizabeth's reign to the foundation of lectures by Dr. Thomas Hood in the house of Sir Thomas Smith, in Gracechurch Street. Edward Wright was lecturer on navigation to the East India Company, and there was a lecture of geography, hydrography, and navigation, read in the chapel of Leadenhall.

In 1572 Sir Humphrey Gilbert (*q.v.*) proposed for the projected Queen Elizabeth's Academy a second mathematician to teach cosmography and astronomy with navigation, at a salary of £66 13*s.* 4*d.* In 1615 Sir George Buck, in his *Third University of England*, tells us that the lecture in the chapel of Leadenhall was discontinued (by 1615), but at the same date there was a lecture of cosmography read in the Blackfriars at the house of Adrianus Marius. Buck further mentions the College of Trinity House at Deptford founded by King Henry VIII, which concerned itself with "the better ordering, governing and instructing and disciplining of mariners, pilots, sailors, and other professors and practisers of the arts of hydrography, and navigation." In 1635 Sir Francis Kynaston (*q.v.*) in his *Museum Minervæ* says, "The professor of Astronomy shall teach Astronomy, Optics, Navigation, Cosmography." A professor was appointed to the chair of astronomy called Nicholas Phiske, while John Speidell (mentioned below), the professor of geometry, had been teacher of navigation also.

In 1673 the first permanent school of naval training was established in connection with Christ's Hospital — the so-called Mathematical School. Forty boys from the Hospital were chosen for their arithmetical and other knowledge to be taught and instructed in the "art of Navigation and the whole science of arithmetic." The master of the Trinity House was then to judge as to the time when such boys could be initiated into the practices of navigation and to be bound out as apprentices for seven years to some captains or commanders of ships. The Trinity House at Deptford Strond was a gild, incorporated in 1529, which controlled the relations between land and sea — for instance, took over public lighthouses, when they were instituted. They had also the binding and enrolling of apprentices to the sea; the examining of mathematical masters for the navy was also in their hands. Apparently Charles II took the idea of naval schools from Louis XIV, King of France, just as the Elizabethan writers followed the example of the Spanish writers. In 1688, Henry Stone, of Skellingthorpe, near Lincoln, gave an endowment to this "royal foundation" for arithmetic and navigation. Samuel Pepys, secretary to the admiralty, and Sir Isaac Newton both showed practical interest in this school. The East India Company was the service into which most of the boys entered.

In 1695 Greenwich Hospital was founded by letters patent from King William III, as a hospital for seamen, their widows and children. In 1715 a school was opened in the Hospital, where it was ordered that "ten boys should be instructed in reading, writing, and navigation by Mr. Weston, mathematical master in the town of Greenwich, and be put out apprentices to masters of ships or others." In 1719 rules were drawn up for the admission, maintenance, and education of the sons of seamen. In 1713 there were 60 boys; in 1789, 150 boys. In 1869 Greenwich Hospital ceased to be an asylum for seamen and the buildings were handed over to the purposes of a Royal Naval College — opened in 1873, for the purpose of providing for the education of naval officers of all ranks above that of midshipman in all branches of theoretical and scientific study bearing upon their profession. Besides navy officers there are officers of the Royal Marine Artillery, Royal Marine Light Infantry and Naval Engineers, and a limited number of apprentices selected annually by competitive examinations from the royal dockyards. Officers of the mercantile marine, and private students of naval architecture and marine engineering by special permission, are admitted to the classes. The Royal Hospital School at Greenwich is still continued. The navigation school founded by the Society of Merchant Venturers at Bristol in 1738 has developed into the Merchant Venturers' Technical College, and includes a preparatory school and secondary day school for boys. The college prepares engineers of all kinds, surveyors, architects, etc., and is not confined to naval instruction. There were navigation schools founded by the Trinity House Corporation at Newcastle-on-Tyne in 1712 and at Hull in 1785. But besides these specific navigation schools, the numerous blue-coat and other colored-coat schools which sprang up in the seventeenth and eighteenth centuries, imitating Christ's Hospital School, in some cases trained the brighter boys for the navy. Thus in 1700, the master of the Grey Coat School, Westminster, was instructed to train picked boys in arithmetic and navigation. This was more frequent in coast than in inland towns. Thus at Plymouth Workhouse, an act of parliament of 1707 required the schoolmaster "to teach such as have a capacity and inclination to learn the art of navigation and such part of the mathematics as tend thereunto." Of private schools where navigation was taught there are the instances of John Speidall in Queen Street, London, 1628; Robert Hartwell, in Fetter Lane, in 1636, and John Kersey in Covent Garden in 1650. There is at least one instance of a grammar school, viz. Woodbridge (Suffolk), the statutes of which in 1662 require the boys to be "fitted for trades or to go to sea."

Amongst the advocates of naval training must be named Sir Thomas Gresham, who in 1575 required his astronomy professor "to read the principles of the sphere and the theoriques of the planets" and to explain the use of common instruments "for the capacity of mariners" and "to apply his subject to the art of navigation." He was followed by Sir Henry Savile (*q.v.*), who, in the statutes for the chair of astronomy at Oxford (1619), requires the professor to explain the whole science of optics, gnomonics, geography, and the rules of navigation, in so far as they are dependent on mathematics.

Sir Clements R. Markham states that in 1641 Sir William Monson renewed the appeals of Hakluyt for the establishment of a lecture on navigation. In 1644 John Milton (*q.v.*) in the *Tractate* made the interesting suggestion that students in the spring weather "sometimes taking sea as far as to our navy, should learn there also what they can in the practical knowledge of sailing and of sea-fight."

In 1705 Lewis Maidwell (*q.v.*) issued: *An Essay upon the Necessity and Excellency of Education, with an Account of Erecting the Royal Mathematical School . . . Upon a Report from the Navy Board, Declaring amongst other Advantages to the Nation, the Particular Services of such a Foundation to the Royal Navy of England in its General Capacities.* This book gives an extensive syllabus of proposed naval instruction. Maidwell also wrote *Proposals revived of establishing and supporting a public school designed . . . for the sea-service of the nation without any public charge* (1699). Much more practical was Jonas Hanway, the inventor of the umbrella, who was the chief founder in 1756 of the Marine Society, whose object was to keep up a supply of seamen for the navy. In 1762 the society had been instrumental in fitting out 5451 boys for naval service. In 1783 Hanway suggested further organization of boys for the naval service by his *Proposal for County Naval free schools to be built on waste lands, giving such effectual instruction to poor boys as may nurse them for the sea-service.* In 1772 the Marine Society was incorporated by act of parliament and in 1786 a ship was procured and boys placed in it for training under an officer of the navy and a schoolmaster. Boys after training went into the king's service and into the East India Company.

At the beginning of the nineteenth century David Morrice wrote the *Young Midshipman's Instructor, with useful hints to parents of sea youth, and to captains and schoolmasters in the Royal Navy,* in which he tells us that the schoolmasters in the navy at that time chiefly were provided from Christ's Hospital and that "drinking is too common" amongst them. Directions are given as to the special duties of the navy schoolmasters. Distinctively naval "academies" on land had grown up — one in Soho Square and another at Chelsea, under William Garrard, who wrote *The Sea-man's Preceptor* in 1802.

In 1856 inspection of the Greenwich Hospital schools, the Royal Dockyard schools and the schools of the Royal Marines was passed over to the charge of the inspectors of the board of education, to report upon them. There are fourteen head schoolmasters, one in each gunnery and torpedo ship and in each of the training ships, and seventy-three naval schoolmasters. In ships with many midshipmen, there is provision of a naval instructor, who is often the chaplain. There are five schools on land for children of marines, and schoolmasters at the naval prisons, at Lewes and Bodmin. The colleges for naval cadets are the Royal Naval Colleges of Greenwich, Dartmouth, Osborne. (See NAVAL EDUCATION.)

With regard to the mercantile marine it is only within the last half century that naval training for officers has been specially provided for, whilst the training of the poor boy has, as an able-bodied seaman, been considered at any rate since the time of Hanway. His Marine Society provided a complete sea outfit for boys and men. In 1786 the society began to give preliminary training in the *Beatty*, and this training has continued till the present day, when the society's ship is the *Warspite.* The society has prepared for sea 66,200 boys, apprenticed to sea life for two years, in which they also receive school instruction, recognized by the board of education as a day technical school. Similarly, the National Refuges for Homeless and Destitute Children (incorporated 1904) established a training ship, the *Arethusa,* stationed off Greenhithe. Other training ships are (1) The *Indefatigable*, New Ferry, Birkenhead, established by Liverpool, in 1865, with a hostel for the sailors on their return from sea. (2) The *Clio*, Bangor, North Wales, of the North Wales, Chester, and Border Counties Training Ship Society. (3) The *Formidable*, of the National Nautical Society at Bristol, a land establishment, and (4) the industrial school ships for homeless and destitute boys, who may be sent voluntarily by parents or by a magistrate's order; but they must be boys who have not been convicted of crime, the reformatory ships being designed for the latter. The industrial school ships include the *Wellesley*, North Shields; *Mount Edgeumbe*, Saltash, Plymouth; *Southampton*, Hull; the *Empress*, Glasgow; *Mars*, Newport, Fife. Boys of a wealthier class of parents are trained for both the royal navy and the merchant service in the naval school training ship *Mercury*, in the River Hamble, Southampton Water, a very complete establishment. Finally, there is also a poor law training ship maintained by the Metropolitan Asylum Board, established in 1876, the *Exmouth*, off Grays, Essex. Of shore establishments the Lancashire Navy League has a Sea Training Home for boys at Liscard, Cheshire, and Dr. Barnardo's organization has the Watts' Naval Training School at Elmham, Norfolk. The reformatory ships are the *Cornwall* off Purfleet, Essex, and the *Akbar* at Liverpool. In connection with the latter, there is a shore school, the Heswell (Cheshire) Nautical School. The cadet training ships, for those who take to the sea, with a view of training for becoming officers in the mercantile marine, include, (1) sea-going training ships, viz. the *Port Jackson*, the *Medway*, under the Devitt and Moore's Ocean Training Ship's Company, Ltd.; and the White Star Line training ship *Mersey*, and (2) stationary ships, *e.g.* the *Worcester* off Greenhithe, Kent, belonging to the Incorporated Thames Nautical Training College (established 1862), the *Conway* off Rock Ferry, Birkenhead, belonging to the Mercantile Marine Service Association of Liverpool. In these schools are taught theoretical and practical seamanship in all branches. Apart from training ships, there remains the method of apprenticeship, in the indentures of which the master of the vessel undertakes to teach the boys the duties of seamanship; but this method not being systematized, the results are very uncertain.

A movement has recently taken place in the direction of including naval science in the work of some of the universities. In the University of Glasgow there is a chair in naval architecture; the courses comprise a junior course of lectures and examinations upon naval architecture and marine engine and boiler design and a senior course of instruction in ship drawing, calculations, and marine engine drawing and design, these subjects receiving due place in the applied science degrees in engineering. In the University of Liverpool, the courses in naval architecture include shipbuilding and laying off, ship construction, ship calculations, strength of ships, resistance and propulsions of ships' stability, oscillations and vibrations of ships, design of a ship.

At the Armstrong College, Newcastle-on-Tyne, there is a professor of naval architecture, and two scholarships are offered, of £50 a year, one by the Shipwright's Company and one by the Committee of Lloyd's Register of £50 a year for naval architecture, awarded in the University of Liverpool. F. W.

See Naval Education; Technical Education.

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SEARS, BARNAS (1802–1880). — Secretary of the State Board of Education of Massachusetts (state superintendent of public instruction); was graduated from Brown University in 1825. He was professor at Hamilton College (1829–1833) and at the Newton Theological Seminary (1836–1842). He succeeded Horace Mann (*q.v.*) as secretary of the Massachusetts state board of education in 1848. From 1855 to 1867 he was president of Brown University, and from 1867 to 1880 he had charge of the Peabody Education Fund (*q.v.*). His publications include *Prussian Mode of Instruction in Latin*; *Life of Martin Luther*, and numerous reports and papers on education. W. S. M.

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SEAT WORK. — See Busy Work.

SEATS AND DESKS. — See Desks and Seats.

SEATS AND SEATING. — See Desks and Seats.

SECONDARY EDUCATION. — A term used to denote a type of education which follows that given in elementary schools. It may be defined in terms of the age of the pupils received. According to the *Regulations for Secondary Schools* issued by the English board of education a secondary school is one which makes provision for pupils between the ages of twelve and seventeen. As a matter of fact, however, many schools retain their pupils to the age of nineteen, that is, until they are prepared to enter the university. Hence a lower and a higher form of secondary education must be distinguished, the one preparing pupils for skilled trades, for commercial pursuits, or for the minor professions, the other preparing for the universities and the higher professions. A third distinction may further be made according to the differentiation in the curriculum. While a general cultural and liberalizing element must be common to both the lower and the higher secondary schools, there is broader scope for specialization and intensification according to the future career of the pupils. While the term "secondary education" has a fairly clear connotation, the term "secondary school" in England is somewhat anomalous, since so many institutions of this type receive pupils of elementary school age. According to the

Regulations, however, only pupils between the ages of twelve and seventeen are recognized for the purposes of the grant.

For further details on secondary education see under the various national systems, *e.g.* ENGLAND, EDUCATION IN; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN; and under the terms used in the different countries for this form of education, *e.g.* ACADEMY; FEES; FREE SCHOOLS; GRAMMAR SCHOOLS; GYMNASIUM; HIGH SCHOOL; HIGH SCHOOLS IN THE UNITED STATES; PUBLIC SCHOOL. For the curriculum, see under the different school subjects, *e.g.* ALGEBRA; GEOGRAPHY; GEOMETRY; GREEK; HISTORY; LATIN; LIBERAL ARTS, SEVEN. See also ATHLETICS; COLLEGE REQUIREMENTS FOR ADMISSION; FAGGING; HIGH SCHOOL FRATERNITIES; PREFECT, etc.

SECRET FRATERNITIES IN THE HIGH SCHOOL. — See HIGH SCHOOL FRATERNITIES.

SECRETARIAL PROFESSION, HISTORY OF THE. — England. — Du Cange gives the date of the first use of *Secretaries*, as equivalent to the modern secretary, in 1340. In the ecclesiastical use, the word was employed much earlier — the *secretarius* being one who took charge of the *secreta* of the Sacristy. There is an instance of the modern use of the term in the Court of King Humbert II and in England of a John Maunsell as "Secretarius noster" in the reign of King Henry III. The king's secretaries were formerly termed the king's *clerks*, *notaries*, and *regi a commentariis*. The earliest use of the term *secretary* in the court, was with respect to such as, being near the king's person, received his commands and were called *clerks of the secret*, whence came the court use of secretary. Then the great lords, following the king's custom, came to give their clerks the name of secretary. The king's secretary was called distinctly "*secretary* of the commands." The term "secretary of state" is said to have come first from Spain; it was assumed by the French, and thence passed into recognized English use in King Henry VIII's time.

In the seventeenth century Richard Braithwait (*q.v.*) "set down *Some Rules and Orders for the Government of the House of an Earle*," and devotes a section to the qualifications of a secretary to a lord. He should be a University man who has studied logic, rhetoric, Latin, and Greek. But he is also to know the Italian, French, and Spanish, with other languages, which he should be able both to speak and to write. He is to be "very secret," and to keep a closet with "cubbardes of drawing boxes and shelves in which to stow away all letters received from the King's Majesty," etc. The secretary's *status* is regarded as similar to that of the gentleman of the horse.

The first treatise on the secretary's duties, discussed quite generally, was in 1586, included in a book entitled *The English Secretarie* by Angel Day, a book mainly concerned with the art of writing epistles and letters "with a declaration of such tropes, figures, and schemes, as either usually or for ornament sake are therein required." Day discusses the parts, place, and office of a secretary. Day requires that the secretary be "well studied" in the Latin tongue. He must have a "quick conceit," and a sound memory. He should be well read in histories and antiquities, and trained in readiness to put himself at the point of view of strangers. The secretary requires birth, education, quality, disposition, conversation, and ability. This recognition of general power and capacity together with practical experience, shown by Angel Day, is precisely the part of the educational ideal so often missing in the treatises specifically treating of education. This form of technical preparation for secretaryship laid down by Day and Braithwait, though intended for the secretary of the individual gentleman or nobleman, was clearly founded upon the characteristics of the noble secretaries who served kings and emperors. If we recall some of the cultured and experienced men who had served as secretaries, we can understand the dignity that attached to the office in the seventeenth century. In the Tudor times, the type of man who acted as king's secretary was that of the most cultivated man with the widest experience and the all-round learning of the age. Thus Andrea Ammonio, of Lucca, had a great reputation as a classical scholar, was the friend of Colet, Grocyn, and Erasmus, and lived at one time with Sir Thomas More, and from 1513-1515 was Latin secretary to King Henry VIII. Richard Pace, the Englishman who succeeded him, *c.* 1515, as secretary to that monarch was educated at Oxford, and passed on to Padua, Ferrara, and Bologna. Stephen Gardiner, his successor, was a doctor of civil and canon law, Rede's lecturer in the University of Cambridge, tutor to a son of the Duke of Norfolk. He became private secretary to Cardinal Wolsey. He was also an ambassador abroad to the Pope, a commissioner to revise Wolsey's Statutes for Ipswich and Oxford, and in 1529 secretary to the King, Henry VIII — in which position we meet with him in Shakespeare's *King Henry VIII* ("Call Gardiner to me, my new secretary," II. 2. 116). Peter Vannes, like Ammonio a native of Lucca, was a man of very wide experience and knowledge who became Dean of Salisbury. He was Latin secretary in the latter part of Henry VIII's reign and continued in office under King Edward VI.

It is needless to speak of the wide range of knowledge of affairs and learning shown by Roger Ascham, though as is well known he prided himself on the beauty of his handwriting, and for this reason wrote many official letters from the university between 1532 and 1544, and from 1546 onwards Ascham was secretary to Sir Richard Moryson in Germany and Austria. In 1553 Ascham became Latin secretary to Queen Mary with a salary of £20. He was retained as Latin secretary by Queen Elizabeth in 1558 and had joined with the office that of the Queen's private tutor. Later in Queen Elizabeth's reign Sir Thomas Lake became Latin secretary in 1600 and is said also to have read Latin and French with her. He was a pupil of Saravia (*q.v.*). He had been amanuensis to Sir Francis Walsingham. He was a member of the Elizabethan Society of Antiquaries. Charles I had, from 1628 onwards, as Latin secretary, G. R. Weckherlyn, a native of Stuttgart and student of law at Tubingen. In *c.* 1613 his title was changed to that of "Secretary for foreign tongues to the joint Committee of the Two Kingdoms. Weckherlyn seems to mark the transition from Latin secretary to the secretaryship for *foreign tongues.* He was succeeded in this post by John Milton, who brings to a climax this profession of secretaryship as marking a completeness of training in many directions and more nearly approaching the all-round demands of his *Tractate,* probably, for the sixteenth and seventeenth centuries, than any other profession. The post of private secretary to a statesman or diplomat has always remained, since the Tudor times, the best of openings to a political or diplomatic career, and has always required the broadest of training, academic and otherwise. The most promising young parliamentarians in England still attach themselves to Secretaries of State as "Parliamentary private secretaries" (unpaid).

Modern Times. — In the increasing complexity and greater activity along business, social, literary, and educational lines to-day, every firm of note, schools, colleges, and institutions of every description, hosts of professional men and women, and many private individuals have found that secretarial help is indispensable. The demand for capable, well-trained secretaries is far greater than the supply, and this condition is likely to prevail for many years to come. It is true that there are many aspirants for such positions, but the inefficiency of so many of these is the despair of an army of employers. Of those who can rise above the mediocre and can satisfactorily meet existing demands there is a serious dearth, a dearth that will be increasingly felt as the need constantly increases.

This secretarial service is not to be confused with the merely clerical help of the ordinary stenographer and typewriter. The latter, at wages from $5 per week and upwards, needs little else than readiness in taking dictation and deftness in operating a machine. The former, at salaries ranging from $700 or $800 a year to many thousands of dollars, requires in addition to clerical ability a higher grade of intelligence and skill, some acquaintance with the best social usages, a knowledge of accounts, a strong sense of responsibility, and a high degree of taste, judgment, and tact, all enabling the employee to enter into the business and social engagements of the employer, and perhaps to take considerable responsibility and initiative during the employer's absence.

Secretaries are classed as private, social, literary, educational, and office. Perhaps all might be included under the one title, private, yet it is convenient at times to be able to differentiate them by special terms, as one function or another is emphasized. Thus, an office secretary, usually a woman, attends to details of filing, indexing, billing, cataloguing, correspondence, etc., and she may be intrusted with the supervision of from one to perhaps fifty clerks, stenographers, and assistants. An educational secretary is one who does responsible office work in an educational institution, or who superintends private educational enterprises for some philanthropic man or woman. Literary secretaries help ministers, authors, lecturers, etc., by looking up references, reading, and compiling notes. By social secretary is meant a man or woman of exceptional tact and executive ability who is employed to foster, organize, and supervise the social, literary, and recreational activities of some large business or manufacturing enterprise like a department store or a factory. This term social is also coming into frequent use to denote the private secretary employed by a woman of wealth who needs assistance in carrying out social and philanthropic engagements.

Courses of Instruction. — Secretarial training courses are now planned chiefly in the interests of young women, and such courses are offered by a small number of colleges (Simmons, Margaret Morrison at Pittsburgh, and Elmira), by an occasional secondary school, and by a few business schools. Schools of the latter type, with one or two illustrious exceptions, unfortunately cannot be depended on to give adequate secretarial training. This is seen even in the simpler vocation of stenography and typewriting, for their standards of entrance and graduation are so low and their courses are so meager, brief, and mechanical that poor results are the rule. Many young girls, deceived by advertising that is as attractive as it is exaggerated and misleading, are persuaded to enter upon such a course as soon as they have completed the eighth grade of a grammar school or have had a year or two in a high school, and after a short term of work, seldom exceeding five or six months and often much less, they receive their certificates and set forth to seek employment. With a vocabulary so meager that they are entirely lost when confronted with more than the most ordinary English, they fail to give satisfaction and become a drug on the market, thronging in the meantime the employment departments of the various companies which sell typewriting machines. The pitiable incompetency of these girls, many of them only sixteen or seventeen years old, can be realized only by those who have suffered again and again in attempting to employ them. Similar results are more than likely to follow when these same schools enter the field of training secretaries.

To become a good private secretary it is desirable that the candidate should have at least a four years' high school course, or its equivalent in self-education and experience, and then take special training for from two to four years more. Schools and colleges in framing courses for secretaries should keep several points in mind as follows: In the first place, the curricula should not only meet the needs of young women of culture and ambition who want a vocational course in order to become self-supporting at once, but of those who wish to take a vocational course simply because the necessity might some day arise of becoming self-supporting, or who want merely a finishing course much more practical than those given in so many seminaries for young women, better fitting them for home life, household management, and for social service in connection with church, school, or other institution.

In the second place, the needs of those who may want a private secretary must be considered by the curriculum makers. Thus it is pertinent to ask, what would be expected of young women in the offices of professional men, lawyers, doctors, ministers, and so on, or in business offices, where secretarial, clerical, and library work calls for much greater skill and wider information than is given by the usual courses in typewriting and stenography? What would be expected in a wealthy, cultured home where a secretary is needed by the lady of the house, who is beset with social and philanthropic calls? Or in a family that divides its time between America and Europe? What would be looked for by a church, school, college, or other institution where great diversity of business and educational enterprise calls for exceptionally capable help? Courses answering to these demands are essentially cultural with a strong vocational bent. They aim to bring the student into touch with many things, people, and places, to the end that vision may be broadened, interests quickened, mind be fully stored, and vocabulary enlarged. Emphasis on the latter point is essential.

Personality, too, is a matter of much consequence. Good breeding, quietness of speech and manner, the quality of being close-mouthed and of being intensely loyal are of supreme importance. So are good taste in dress, a sweet and well-modulated voice, habits of promptness, and careful management of one's own personal finances. It is desirable that a secretary be an acceptable companion and an interesting conversationalist. Social attractiveness counts for much.

In England. — Professional recognition has been accorded in the case of the Civil Service, in the case of town clerks, and clerks to municipal and county authorities. An effort has been made to secure professional recognition for other secretaries who satisfy necessary qualifications, by the establishment of an Institute of Secretaries in 1891. A journal was started in 1892, called *The Secretary.* In 1896 and in some later years, courses of lectures were given, followed by examinations, in company law, bookkeeping, mercantile law and political economy. In 1903 the institute received its charter and became known as *The Chartered Institute of Secretaries.* The institute possesses a library and issues a yearbook. Its offices are 65, London Wall E.C. The examinations which it regulates are: I. The Preliminary, in subjects of general education; II. The Intermediate or Associates' Examination in professional subjects; III. The Final or Fellows' Examination in professional subjects. The subjects for No. II are commercial correspondence, including filing and indexing documents, précis, reports and minutes; commercial arithmetic; bookkeeping and accounts; mercantile law or company law; one of the following: (*a*) political economy; (*b*) mercantile law or company law, if not taken as above; (*c*) French, German, Italian, Spanish languages, including an oral examination. No. III repeats very much the same subjects at a higher level.

Courses in the United States. — How closely existing courses meet the ideals set forth above may be seen in the catalogues of secondary and higher institutions that have already entered this field. Thus Simmons College issues a bulletin of thirty-two pages on secretarial studies, announcing entrance requirements at sixteen points, and offering a four-year course for high-school graduates, a one-year course for college graduates, and a two-year condensed course for high school graduates. The B.S. degree is granted for the completion of either of the first two. The four-year course includes an average of twenty-two hours per week for the four years in the following subjects, some of which are electives: *Languages*, English, French, German, Italian, Spanish; *Science*, biology (hygiene), physics; *History*, European, American, economic history of England; *Philosophy and Sociology*, ethics, psychology, child psychology, economics, sociology, philanthropic problems; *Technical*, accounts, business methods, commerce, commercial law, commercial teaching, library and reference cataloguing, shorthand, typewriting.

The Elmira course is as follows: elementary and advanced business law, accounting, shorthand, typewriting, business organization and management, commercial institutions and transportation, banking and investments, money and credit, standards of living and administration of income, social problems.

A New York school for girls offers the following course as a preparation for either secretarial work or teaching in a private kindergarten. It is equivalent to the regular two-year courses given in the state normal, and city training schools, and presupposes graduation from a high-school course.

	Hours
English: Voice training, articulation, enunciation, phonics, and spelling	80
English: Children's literature, story-telling, interpretative reading	120
English: Composition, business and social correspondence, book reviewing, story writing	120
French and German: Conversation and composition	480
Arithmetic and account keeping	80
Penmanship and spelling (until proficient).	
Geography: Routes and methods of travel illustrated by stereographs, stereopticon, and pictures	80
History: Philosophy and interpretation of ancient, medieval, and modern	160
Sociology, economics, current events	80
Nature study and woodcraft	80
Interpretative art	80
Interpretative music	80
Household economics, organizing menus, cooking, marketing, setting the table, entertaining guests, chamber work, cleaning, dusting, ventilating, sick room cookery, dietetics	80
Logic	80
Psychology	100
Playground methods, folk dancing, home entertainments	60
Social forms and functions	20
Office theory and practice, stenography, typewriting, library methods	480
Visitation of prominent buildings and places of interest, such as museums, churches, educational and charitable institutions, the great hotels, business centers, playgrounds	60

In certain cases, substitutions for some of the above subjects may be accepted by the school, on consulting with the headmaster.

To many, the work of a private secretary is more congenial than teaching, and to those who are well prepared it will often prove more remunerative. A secretary who can "write a good letter, who can take an employer's idea and carry it out in all its details, look after office accounts, read foreign correspondence, prepare abstracts, consult authorities, and in many cases act as an employer's agent or representative," need never be without a good position. A salary of $60 to $80 per month may reasonably be expected, but one must not be misled by the highly colored statements of some secretarial school prospectuses into expecting large salaries. It is true that many a young woman has received $100 a month, and there are instances of ladies receiving considerably more. But those are very exceptional cases. Yet the fact remains that for those who will take the trouble to make thorough preparation there are excellent possibilities ahead, just as large as they are capable of filling. F. W. and M. T. S.

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For the Secretary, in the statesman and diplomat use of the term, see *The State and Dignity of a Secretary of State's Place with the care and Peril thereof; written by Robert Cecil, late Earl of Salisbury*, 1642.

For account of Secretaries of State, see *Encyclopædia Britannica*, 11th ed., Vol. XXIV, p. 572. For history of the use of the term *Secretary*, see Chambers, *Cyclopædia* (1786), Vol. IV, under *Secretary*.

There are many books with the title Secretary or its equivalent, *e.g.* by Sansovino, 1564, Tasso Torquato, 1601, and in England cf. *The Secretaries Studie* by S. S. Gent, 1652. *The Secretary's Guide* in 1735; *The Secretaries' Assistant*, 1821, which might be described as "Helps to letter-writing." For this type of book see EPISTOLÆ.

For the present effort in England to make secretaryship a profession, see Day, Russell. *Secretaries. A Paper read before the Members of the Chartered Institute of Secretaries*, 65 London Wall, London E.C.

SECTARIAN SCHOOLS, AND SECTARIANISM. — See CHURCH SCHOOLS; PAROCHIAL SCHOOLS; also BIBLE IN PUBLIC SCHOOLS; RELIGIOUS EDUCATION.

SECTION GRANTS FOR EDUCATION. — See NATIONAL GOVERNMENT AND EDUCATION; SCHOOL FUNDS.

SECULAR SCHOOLS. — Those schools, as a rule maintained out of public funds, in which no religious instruction is given; that is to say, the pupils are not taught the tenets or doctrines of any denomination. This does not exclude the teaching of the Bible without comment, as in England. In America, however, the principle has been carried further and secular schools are schools, publicly maintained, in which no religious instruction of any kind is given. In France there has been complete secularization of schools and also in Victoria, Australia.

See BIBLE IN THE SCHOOLS; CHURCH ATTENDANCE OF SCHOLARS; CHURCH SCHOOLS; CONSCIENCE CLAUSE; COWPER-TEMPLE CLAUSE; PAROCHIAL SCHOOL SYSTEMS; RELIGIOUS EDUCATION; and the articles on the National Systems, *e.g.* ENGLAND, EDUCATION IN; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN, etc.

SEDBERGH SCHOOL, ENGLAND. — See GRAMMAR SCHOOL; PUBLIC SCHOOLS.

SEELYE, JULIUS HAWLEY (1824–1895). — College president; graduated from Amherst College in 1849 and the Auburn Theological Seminary in 1852. He subsequently studied at the University of Halle, Germany. He engaged for a time in the ministry. He was professor at Amherst from 1858 to 1875 and president of the college from 1875 to 1890. During his presidency the self-governing system of discipline was made a feature of the college. His publications include *Citizenship*, *Duty*, *Relation of Learning and Religion*, and a translation of Schwegler's *History of Philosophy*. W. S. M.

See AMHERST COLLEGE.

SEGREGATION OF SEXES. — See COEDUCATION; WOMEN, HIGHER EDUCATION OF.

Edouard Séguin (1812–1880). See p. 317.

James Pyle Wickersham (1825–1891). See p. 772.

Edward Austin Sheldon (1832–1897). See p. 334.

John Daniel Runkle (1822–1902). See p. 220.

A GROUP OF AMERICAN EDUCATORS.

SÉGUIN, EDOUARD (1812–1880). — Organizer of schools for feeble-minded children; educated at the colleges of Auxerre and St. Louis (Paris) in France, and studied medicine under the distinguished Itard. He established at Paris in 1839 the first school for the training of feeble-minded children. Seguin came to America in 1848 and took an active part in the organization of schools for the feeble-minded. He represented the United States at the Vienna exposition of 1873, and his *Report on Education* (Milwaukee, 1880) gives an excellent account of the educational exhibits at that exposition. His other publications include *Idiocy and its Treatment by the Physiological Method* (1866), *New Facts and Remarks concerning Idiocy* (1870), *Psycho-physiological Training of an Idiotic Eye* (1880), and a half-dozen works published in French on the psychology and pedagogy of the feeble-minded. W. S. M.

See Defectives, Schools for; Montessori System.

SEISMOLOGY. — See Geology.

SELDEN, JOHN (1584–1654). — The scholar of the parliamentarian party of Charles I's reign, was educated at Chichester Grammar School, and at Hart Hall, Oxford. He entered Clifford Inn and the Inner Temple and in 1617 wrote the *History of Tithes*, which was suppressed. Apart from his political career he was the greatest lawyer of the time, as is evidenced by such a work as his *Titles of Honour* (which Hallam described as "amongst the greatest achievements in erudition that any English writer has performed"), embodying profound research into the history and antiquities of both English and foreign countries, 1614. In 1617 he published the *De Deis Syris, Syntagmata duo* which placed him in the ranks of the first European scholars of the age; in 1635, *Mare Clausum*; in 1640, *De Jure Naturali*; and in 1647, *Juxta Hebræos* and *Fleta*. These works prove that he was also one of the most conspicuous orientalists, Græcists, and general, as well as legal, scholars of the time.

Educationally, apart from scholarship, Selden's services are mainly connected with the description (1625) of the marbles brought by the Earl of Arundel from Greece in 1624; and with the collection of books in his legal library. The *Marmora Arundelliana sive Saxa Græca incisa* describe the marbles variously known as the Arundel, the Oxford, or the Parian, Marbles. In the treatise are included a preface, an apparatus, a *canon chronologicus* and historical notes. The treatise constitutes what Hallam calls "a sort of era in lapidary learning" and helped (together with Archbishop Ussher's work and that of Scaliger) to form a basis for a new chronological science. As to his library, a number of his books went to the Inner Temple library, and the rest were given to the University of Oxford, where they were placed in a separate room. Selden's reputation was high throughout Europe, and was dwelt upon by Grotius, Salmasius, Bochart, G. Vossius, Gronovius, and Daniel Heinsius. His indirect influence on education was great. In historical and legal studies, as it has been said, he seems to have been regarded "somewhat in the light of a valuable piece of national property like a museum or a great public library." F. W.

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SELECTION, NATURAL. — See Acquired Characteristics; Eugenics; Evolution; Habit; Heredity; Instincts.

SELECTION OF TEACHERS. — See Teachers, Appointment of.

SELF. — The conception of self reminds one of St. Augustine's saying about time: Everybody knows what it is, but no one can tell. Its connotation is not easy to give satisfactorily, but there is little difficulty in picking out the objects which it denotes. We do not regard sticks and stones as selves; most persons would deny that plants had self-hood, and would ascribe it only doubtfully to animals with the exception, probably, of dogs, horses, and such other animals as have a close relation to man. Three elements seem to be involved in self-hood. The first is capacity for feeling, especially feeling pleasure and pain. The second is the capacity to think of these experiences, to objectify them, as it is usually said. Merely to suffer pains and enjoy pleasures as they come and go, without recollecting them, connecting them with objects as their causes and without making the objects ends of anticipation, desire, and aversion, would hardly mark off a self. The self involves the duration of a center of pains and pleasures through a succession of experiences so that the passing experiences, in spite of their diversity and transitoriness, get referred to one another. These statements do not mean that there is any capacity for feeling pleasures and pains by themselves in isolation from all other qualities, but simply that the traits of objects in virtue of which they affect the well-being of a living creature for good or evil becomes a centralizing and focusing point, with respect to which objects are remembered and anticipated. Thus there is effected a mutual cross reference which is basic to the existence of self-hood. This integration of experiences with one another, effected on the basis of the painful or pleasurable quality of the experiences, constitutes thought in its germinal and basic form. The third and culminating element is the social. While the two elements already mentioned would secure a certain massing and inchoate unification of experiences, they would not constitute self-hood. A contrast is required. When living beings live together under conditions where they have to consult, in directing their experiences and forming their ends, the welfare of others, each is compelled to distinguish others from himself, and, by a correlative process, his own being and aims from those of others. Without the consciousness of *alter*, there can be no consciousness of *ego*; and the more distinct the consciousness of others, the more definite the thought of one's ego. The older notion that one begins with a clear notion of his own self-hood and then proceeds by a process of inferential projection, guided by analogy, to attribute self-hood to others, goes contrary to the facts. The child is treated by others as an end in himself; that is, as a being whose feelings, thoughts, and aims are to be respected and as one who is like his fellows in the claims made upon him, and he accordingly learns to think of himself in the same way. He *becomes* a self, as he becomes an integrated yet distinct member of an association whose constituent elements have rights and duties with respect to one another. The point comes out clearly in the distinction between two types of selfishness: spontaneous and reflective. Ordinary selfishness does not mean that an individual is consciously thinking of himself and of his own advantage and deliberately preferring his own welfare to that of others. It means rather that he is unconsciously engrossed in certain objects and a certain course of conduct without thinking of its relation either to himself or to others. As others, however, find this course obnoxious to their own welfare, they manifest disapproval and attribute conscious intention. In this way, they tend to make the person relate his action to a conscious center. As a result, deliberate or reflective selfishness and unselfishness become possible.

While, then, self-hood has a natural psychological basis, it is, in its realization, a social and a moral fact. This social and moral quality constitutes its importance from the educational point of view. In tribal societies, the well-being that constitutes the central point of reference in determining and judging conduct is to a large extent that of the group *en masse*, as over against other groups. Self-hood seems to belong to the tribe or clan, rather than to its members. There is correspondingly little sense of distinctive personality or subjectivity. The individual belongs, quite literally, to his group. With the rise of distinctions of superior and inferior, of chieftainship and kingship, a few, the rulers, think of themselves as having a special position, special ends, and a welfare which is to be specially, even uniquely, consulted. They achieve, in brief, a sense of self-hood. In the Greek city-state, each free citizen was treated, in his capacity of free citizen, as an individual, but self-hood was denied to slaves, serfs, and women, and, except in a latent sense, to children. Even with reference to free individuals, self-hood was not emphasized so much as the duty of subordination to the community interest. Early and medieval Christianity gave a powerful impetus to the sense of individuality, through the introduction of the notion of an eternal well-being or misery, depending upon the relation taken to God through the Church. The social organization remained such a fundamental factor in determining this relationship, however, that the conception of subjectivity still remained undeveloped. Instead of the idea of the self there appeared that of a "soul" which was possessed by all as an individual entity. In Protestantism, the individual became overt; the Church consisted of individuals who had, through direct relationship to God, found salvation, instead of its being the instrumentality by means of which the individual attained salvation. The growth of the principle of subjectivity was also emphasized by political conditions. The conception of the State underwent a change analogous to that of the Church. Instead of being, as in classic thought, prior to the individual, it was made by the free choice and voluntary compact of individuals. The formula of Kant, that every individual is to be treated morally as an end in himself, never as a means to others, is perhaps the first explicit and sweeping statement of the modern principle of the universality of self-hood.

This growth of the democratic spirit has modified the conception of childhood. The tendency is to conceive of children as already members of a social whole, in virtue of which they possess rights, instead of having rights merely potentially, in virtue of a future social membership. This conception corresponds to the extraordinarily rapid growth of interest in the education of the young characteristic of the last century. Education is conceived as a public duty which is owed to the young. The conception has also modified, almost transformed, in fact, the discipline of the young, and has affected, though less completely, the methods of teaching. The growing displacement of harsh and punitive discipline by milder methods and by greater regard for personal intelligence, and the disposition to use methods that throw more intellectual responsibility upon the pupil and less, comparatively, upon teacher and text, are practical expressions of the extension of the principle of self-hood of children. It is obvious that the revolution — for it is hardly less than that — brings new dangers and difficulties with its gains. When children are treated in external ways as full-fledged selves, while their power of reflection and the habit of judging from a social point of view are not cultivated, the result is a mere relaxation of external control, without the development of control from within through the formation of a genuine self-hood.

A marked characteristic of the modern conception of the self, as developed by psychologists, is the latitude given to diversity, in contrast with the rigid unity of the older notion. This extends not merely to recognition of specific and ineradicable differences of structure and function in different selves, but also to the coexistence of different and ununified tendencies, almost minor selves, in the same person. Because of the dependence of the self upon modes of social treatment, a person who enters into different sets of associations tends to develop selves that are only loosely connected with one another. A child is one person in family life, and another with his fellows upon the street, just as an adult may have one self in business and another at home or in the church. Unity of self is not an original datum, but an achievement. The responsibility of the school in coördinating into an orderly whole the diversity of social tendencies which, in the complexity of contemporary life, tend to dissipate and distract self-hood, is constantly increasing. Another aspect of the variety of the self is seen in James's distinction of a bodily, a social, and a spiritual self. The influence of reference to well-being may make itself felt in different and only loosely connected fields. Pleasures and pains referred directly to the body tend to build up the thought of the bodily self. The social self (using the term social in a narrower sense than it has been used before in this article) depends upon the thought of the self that is attributed to others — the thought of one's self as reflected in popularity, reputation, esteem by others, etc. (See SELF-CONSCIOUSNESS.) The spiritual self refers to the unification of experiences with reference to some ideal self-hood to which one aspires, or to one's thought of one's self as reflected, not in current esteem, but in the mind of some ideal judge that one imagines to have perfect insight and to pass upon one's character. J. D.

See CHARACTER; INDIVIDUALITY; PERSONALITY.

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SELF ACTIVITY. — See ACTIVITY.

SELF-CONSCIOUSNESS. — The popular and the philosophic meaning of this term (the latter being derived from the German idealistic philosophy) have nothing in common. In idiomatic usage, self-consciousness indicates that attention is given to the thought of one's self which one assumes to be held by others, so that this thought intervenes between the person and effective attention to the object in hand. One is thinking about himself and about others' attitude to himself when he should be thinking about some work or subject matter. Thus the term contains a shade of disparagement. Self-consciousness takes two forms according as it accompanies a pleasurable or a painful idea of self. The first shows itself in showing off, "performing," to attract the notice of others, etc. But to some people the idea that the attention of others is upon them is painful, instead of tickling their vanity; and their self-consciousness manifests itself in shyness, constraint, embarrassment and confusion, when doing things in the presence of others, unless they "forget" themselves. While vanity and timidity are natural biological traits, their transformation into the two types of self-consciousness mentioned is the product of the social environment, being the reflex effect of the way in which others treat a child, especially in "noticing" him.

There are two considerations intermediate between this popular meaning and the philosophic one noted below. One of these involves a bad or at least doubtful meaning, while the other expresses an important factor in an intelligent life. Both are moral in nature. The first is introspective curiosity concerning the goodness of one's motives, the disposition to think about one's self from the moral point of view. Since this may easily lead to a morbid interest in one's self which is none the less egotistic because concerned with one's goodness or holiness, and because such a morbid interest tends to be paralyzing to frank and generous overt action, self-consciousness in this sense gets the doubtful meaning referred to. The good meaning is associated with the Socratic "Know thyself" as the basis of morals. This does not imply a purely "inner" or introspective knowledge of self, but rather a knowledge of one's proper end, of what one is good for, of the duties and responsibilities through which one enters into such relations to the world and to others as are required to realize one's self.

The recent technical philosophic meaning of self-consciousness comes ultimately from the Kantian philosophy. Kant, in developing his doctrine that knowledge is impossible without the operation of certain functions of thought, was led to insist upon the unity of thought, which accompanied the activity of all the thought functions. Without this reference to a logical unity, the cognitive correlate of the unity of the objective world would be lacking. Kant referred to this ultimate unity as the transcendental ego, and as the "I think" which must accompany all knowing experiences — that is, all ideas of objects as objects.

He insisted, however, upon its merely formal and logical character. He insisted that it was not to be identified with mind, the self, soul, spirit, in any concrete sense. His successors, especially Fichte and Hegel, regarded this restriction as itself illogical and identified self-consciousness with the principle of ultimate unity differentiating, while relating, the objective and the subjective world, physical and mental phenomena. According to the modern Hegelians (Caird, Henry Jones, etc.) self-consciousness is the highest and most complete (or "concrete") of all categories, overcoming the one-sidedness of all purely physical and psychological principles of explanation, by penetrating to a spiritual unity expressed in both. In many writers, like the last named, self-consciousness tends to become a glib term by reference to which all difficulties are disposed of. J. D.

SELF-CONTROL. — See WILL; also CONDUCT; CONTROL; HABIT; MORAL EDUCATION.

SELF-EDUCATION. — A term used to refer to education obtained by an individual by his own efforts without the direction of a school or other educational institution, or of a teacher. While laudable in itself, self-education is defective because, as a rule, it is miscellaneous, undirected, and in the main obtained merely from books and thus excludes the influence of one mind or personality on another. To this extent degrees obtained in non-teaching universities or courses taken by correspondence are of less value than work done under direction and with the help of a teacher.

SELF-GOVERNMENT IN SCHOOLS. — **The Nature of Student Self-government.** — A condition of order or social coöperation is fundamental to effective teaching at school. Hence the discipline of the school or the disciplinary power of the teacher or principal has always been a quality of prime importance in the eyes of a critical public. The result has been that the school has traditionally aimed to obtain an immediate orderliness in the school life, too frequently to the great neglect of the final educative effect of the methods employed. Discipline was then regarded as a necessary evil, not as an educative opportunity. Partly through the pressure of a social opinion which has increased its regard for persons, more particularly for children, and which has criticized the product of the schools in terms of the child's ability for self-control and social coöperation under the stress of actual world life; and partly through the influence of a saner psychology which has gripped the schools, the emphasis has been taken off a type of discipline exclusively for immediate order and placed upon another which gives both personal growth and a lasting effective coöperation at school.

(For the history of self-government in schools, see PREFECT AND THE PREFECTURAL SYSTEM; also MONITORIAL SYSTEM.)

This new impulse in the management of schools has expressed itself in various attempts to enlarge the freedom, initiative, and responsibility of children in the management of their own activities both in and out of the classroom. Historically this tendency first expressed itself among the most mature school groups. It has long been found in the "honor system" of the colleges and universities, then in plans for pupil self-government in the high schools, and last in the elementary schools. The "honor systems" of the higher schools represent a somewhat different movement from that for "pupil self-government" in the lower schools. As college students have traditionally enjoyed a large measure of liberty and self-control in the management of their athletics and social activities, and, to a considerable degree, of their dormitory life, the official use of student initiative and responsibility has largely attached itself to the examination system where the academic staff has found it difficult to control dishonesty and at the same time insure the development of appropriate attitudes and habits on the part of the students. In some places even the disciplinary authority usually exercised by the faculty and its committees has actually been turned over to committees of the student body for primary handling; this, however, is exceptional. In the public day schools, both secondary and elementary, the teacher's control of all school activities in and out of classes has been more complete and effective, and the liberalization of discipline, once set in motion, has covered all the activities of elementary and high school children, but mainly their extra-schoolroom activities. Thus whereas the evil of cheating has been chiefly responsible for the "honor system" in the colleges, the self-government systems of the lower schools have been the product of two wider influences: (1) The attempt to get a more objective and active teaching of civics, and (2) the effort to make school discipline and government yield growth in the social character of each student. The two systems will need to be discussed separately.

Honor System in Colleges. — The "Honor System" of the colleges aims at dispensing with the vigilant supervision of examinations by teachers and relies on the honesty of the students. In some form, it is found among about a quarter of the American higher schools, more particularly among those in the Southern and Western states. One investigation, receiving 280 replies to questionnaires sent to 350 colleges and universities, shows that about 29 per cent of all American colleges use some sort of honor system. Of this total 44 per cent are situated south of the Mason and Dixon line and east of the Mississippi River.

Only 11 per cent are in New England. Of the honor-system colleges, only about 66 per cent are exclusively for men, 17 per cent exclusively for women and 17 per cent coeducational. As the honor system seems to have been first developed in a notable way at the University of Virginia, a Southern institution exclusively for men, imitation, following the lines of similarity of condition, would explain the distribution as regards geographical location and sex.

There are many variations in the use of the honor system. Some institutions exact no pledge whatever from the students, but repose trust in the student body as a matter of course, expecting honesty to be a normal response, one more likely to be obtained since no special effort is made to watch the students or to exact a formal statement of the students' obligation. Generally speaking, however, some formal pledge is usually exacted with the establishment of the honor system. It may vary from an individual pledge to the instructor accompanying each paper handed in, as at Princeton, to a broad obligation to the faculty assumed by resolution of the student body, wherein the students administer the system through their own committees. Perhaps one half of the colleges exacting some formal pledge go beyond the guarantee of personal honesty and provide for some form of reporting the dishonesty of students. In this somewhat extreme practice, the student pledges himself both to be honest himself and to report any cheating that comes to his knowledge. The report is usually confidential and is made to the president, the faculty, or a student committee.

It is difficult to evaluate the " honor system " in comparison with the method of supervised examinations, and still more to determine which of the various methods used in applying the honor-system seems intrinsically the best. Experience shows such widely divergent results, that honesty seems to be more a matter of institutional morals than of a particular system. Investigation shows that the university students of England and Scotland, though subject to strict supervision at their examinations, would regard any dishonesty as debasing, an act not to be condoned. Again, some institutions that have attempted the honor system have returned to the method of supervised examinations because the morale requisite to sustain the system has not been sufficiently powerful or stable. The attitude of loyalty to one's associates is often too powerful to be overcome by any obligation to report a discrepancy. Hence, the system has often failed to attain the ends which have been the special arguments for its use. It is probable that other factors besides the system itself are more important, such as the traditions of the school, the relations of faculty and students, and the concrete manner in which the method is administered. In any case, the chief function of the authorities should be to develop a proper institutional morale with such gradual modifications in the system of supervision and personal responsibility as will give a system that will organize the best stable attitude of the student body without subjecting individuals to a moral overpressure or a confusion which would bring the system under suspicion and disrepute.

Self-government in Schools. — The influences which have operated toward the introduction of an increased degree of self-government in the public schools are numerous. They have touched the elementary and secondary schools at several points with different emphasis and effort. The movement which is found in the high school and the grammar grades of the elementary school apparently originated in an effort to make classroom teaching of civil government more effective through an active objectification by the children. It was at first a kind of mimicry of governmental forms, a temporary device of teaching, restricted to the classroom. Later, partly to add a deeper sense of reality and partly to develop the character requisite to self-government, it was applied to the life of the school outside the classroom. Hence, the device for self-government became the school city or the school state, the machinery of government used by the American state or municipality being somewhat modified to meet the simpler needs of school life. In most cases the official system took the form of a school city, with a mayor and other executive officers, police, health department, common council, justices, etc. Less frequently the simpler tripartite system of the state with its executive, legislative, and judicial branches was installed as a school state. Undoubtedly the device was more or less effective as a means of instruction, but the unwieldy governmental machinery, the product of a vastly different social group and life, became an impediment to real self-government by the children. When the attractiveness of the system as a novel and playful mimicry had passed, interest disappeared, and a point of diminishing educational returns was reached. However, the effect of the experiment proved the value of some measure of self-government among children. Training in self-control and a right attitude towards one's fellows became a dominant purpose, and instruction in civil government returned to the classroom. This modification of the aims of the school city led to a simplification of the machinery of government, until, with a simple series of class tribunes and weekly elections and a few other simple governmental devices, the machinery of self-government approximated the needs of the social life of children at school. The result was an enlarged success, and an extension of the use of pupil self-government among schools. It has an undoubted value in developing in real social situations the elements of personal self-control, right reverences, and tolerances for the other children, a respect for law and authority, and a sense of the worth of order and coöperation as a basis for work and achievement. More particularly where play and sociability are fostered so that children have increased contacts, desires, and therefore enlarged needs for coöperation, the use of an appropriate system of self-government affords a practical laboratory for dealing with human affairs. Out of the multitudinous number of concrete human problems that children learn by experience to master, they gradually acquire ideals for self-control and the management of others which are highly useful in adult social life. It must not be assumed, however, that such desirable results come just through exposure to situation and machinery. A system of pupil self-government does not relieve the principal and the teaching staff of the responsibility for discipline; it increases it, for under this new conception the governmental process must not only develop immediate social order, but must at the same time be an educative process. The teacher's function has merely to be exercised in a new way. Where before governing was chiefly "disciplining," that is, a direct personal correction of maladjustments, now it has become a complicated and indirect means of preventing school offenses or breaches of good order. And every effort of such indirect influence and supervision must take account of individuals so that personal growth as well as coöperation is assured.

In the lowest elementary grades, the liberalizing of school government has come in a far different way. Not the institutional ideals of adult politics, but those borrowed from the home have been effective in kindergarten and primary grades. The old authoritative and more or less ascetic rendering of discipline has passed before the new maternal attitude of the teachers. The formal silence and obedience and the rigid military movements of the older schools have disappeared, and the freedom and informality which characterize the life of children in the best homes have entered in their stead. The kindergarten has been largely responsible for this more kindly and free spirit of life in the lowest elementary grades. The new psychology and child study have reënforced the belief in a method which tolerates individuality, generates initiative, and looks to the natural checks of social circumstance to develop responsibility among children in action. But this system of ideals borrowed largely from the household has had its frailties, too, though they have not been so conspicuous or far reaching as those of the school city and the school state. The freedom of children has tended to become license; at least the slighter opportunities, no less important because they are slighter, of training children into coöperation with each other and with the reasonable authority of the school, have not been fully utilized by the more ardent apostles of freedom and self-activity in the primary school.

In general, the movement for self-government among the pupils of the schools has meant a clear gain. It has converted discipline from a stern and regrettable necessity into one of the school's richest educative opportunities. While it is well to note the fact that the school is a transient institutional life for the child, one that prepares for something else, it is nevertheless necessary to emphasize the truth that it is a real existence with limiting conditions of its own. The method of school government must take this into account. The school, on the one hand, is not a city or a state; on the other, it is not a home. One asks too much and the other too little. The school is itself, and an extremely varied self the child finds it as he proceeds from kindergarten to the university. The spirit, method, and machinery of government must therefore fit the conditions. Age, sex, the school traditions, the personality of the teachers, the attitude of the community from which the children come and the ultimate social conditions and ideals to be served, — each of these should affect the structure and method of school government. H. S.

See School Management; Monitorial System; Prefect and the Prefectural System; Public Schools, English.

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SEMICIRCULAR CANALS. — See Dizziness; Ear.

SEMINAR. — A term employed originally in Germany to denote a group of advanced students in the universities, directed by professors for purposes of investigation or research or of introduction into the methods of research. It is probable that the use of the word in this sense was popularized by Francke who at the beginning of the eighteenth century established the *Seminarium praeceptorum* — a training school for teachers. The introduction of the seminar into the university is credited to J. M. Gesner (*q.v.*) who in 1737 established at Göttingen a philosophical seminar to train theologians for the teaching profession. Academic, pedagogic, and practical work was done. The seminar continued under Heyne (*q.v.*) who trained so many classical scholars. Its further development took place under F. A. Wolf at Halle where, although appointed professor of philology and pedagogy, he concentrated his attention on the philological seminar (1878). In the nineteenth century the seminars in Germany have become the "nurseries of scientific research." Some seminars have received special endowments and equipment in the form of libraries and laboratories, and here the professors with their assistants and students carry on the work of special investigation. More especially is the dissertation work of the students conducted in the seminar and subjected step by step to the criticism of professors and students. As an introduction to the work of the seminar, proseminars have been established for younger students.

The seminar method was strongly advocated by students who returned from German universities, and was introduced into America in 1871–1872 when Professor Charles K. Adams (*q.v.*) adopted it in some of his history classes at the University of Michigan (*q.v.*). "A seminary," he said, "according to the German idea, is a small group of advanced students carrying on investigations of an original nature under the general guidance of their instructor." The seminar method has remained a part of the university or post-graduate work since the foundation of Johns Hopkins University (*q.v.*) in 1876 and the general impetus then given to the provision of post-graduate studies.

For the seminar as a training school for teachers (*Pädagogisches Seminar* for secondary school teachers, and *Volksschullehrerseminar* for elementary school teachers), see Germany, Education in.

See Universities; also Experimentation; Research.

SEMINARY GRANTS. — Beginning with the admission of Ohio to the Union in 1802, and continued in the case of all new states since that time, Congress has given to each state two, and to a few states more than two, sections of land (46,080 acres) for the endowment of a seminary or a university of learning. In the case of the states admitted beginning with 1889, still larger grants for university purposes have been made. The early grants were long known as the Seminary Grants, and the fund created from the sale of the land was known as the Seminary Fund. Within recent decades the term seminary has been dropped, and university used instead. E. P. C.

See National Government and Education.

SEMITIC EDUCATION. — See Jewish Education.

SEMITIC LANGUAGE AND LITERATURE. — See Oriental Language and Literature.

SEMLER, CHRISTOPHER (1669–1740). — Founder of the first German *Realschule*, was born in Halle, studied at the universities of Leipzig and Jena, and became (1697) a lecturer at the University of Halle. Two years later he became also a pastor and superintendent of elementary schools in his native city.

Semler was intensely interested in mathematics, astronomy, physics, and mechanics. He made many useful inventions and spent much time and money in making apparatus and experiments. In 1708 he opened a school for future artisans, which he called "a mathematical and mechanical real-school," because its object was the study of real things, by which he meant scientific and mechanical instruments, animals, plants, and minerals, chemical apparatus, tools, etc. The school was merely supplementary to the ordinary schools, the course being only two hours a week. For some reason the school was given up after about three years and, although it was revived by Semler in 1737, it soon ceased to exist, probably on account of the death of its founder, which occurred in the following year. Still, in spite of these small and crude beginnings, the idea survived, was taken up by Hecker (*q.v.*) in Berlin, and from it has sprung the vast system of "real," industrial, trade, and continuation schools which we find in Germany at the present day. F. M.

SENECA, LUCIUS ANNÆUS (4 B.C.–65 A.D.). — The celebrated Roman Stoic philosopher and statesman, was the son of an eminent Spanish rhetorician, under whose care he received a liberal education at Rome. He was successful as an orator and rose to high office under the Emperor Claudius. Accused of an intrigue with a member of the royal family, he spent eight years in exile in Corsica, where he sought consolation in philosophy. He was recalled to Rome, held the offices of prætor and consul, and amassed a princely fortune. He became the confidential adviser of the Empress and was entrusted with the education of her son, the future Emperor Nero. This was his chief experience as an educator, and the excellence of Nero's early life was no doubt due to his training, although he proved unable later on to control the depraved passions of his royal pupil.

Seneca was the most eminent Latin writer of the Silver Age and was master of a polished and epigrammatic style. His writings were mainly on moral subjects. Most of them are in fact Stoic sermons, dealing with practical questions of personal conduct. His *Moral Letters* form one of the most important ethical treatises of antiquity and are still widely read and studied. His ten *Tragedies* were never acted, but their influence upon the development of the French drama was considerable. Scattered through his *Letters to Lucilius* are many valuable pedagogical precepts. He strove to direct education to practical ends and urged that a multiplicity of studies should be avoided and thorough work in short compass insisted upon. Some of his sayings, such as the following, have become proverbial. "The best method of being taught is to teach." "The end is attained sooner by example than by precept." "We should learn, not for the sake of school, but for the great uses of life." His conviction as to the wisdom of profoundly studying a single book was expressed in the saying, "I fear (*i.e.* have a wholesome respect for) the man of one book." W. R.

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SENEGAL. — See French Colonies, Education in.

SENESCENCE. — The general decline in mental and nervous powers which accompanies old age. There is a general decline in the keenness of the senses, in motor powers, and in the power of retaining new impressions. Memory commonly shows a loss of all of those experiences which have been recently acquired. There is a tendency to return to the experience of early youth. C. H. J.

SENSATION. — A sensation is a simple element of experience which arises through the excitation of some organ of sense. Thus, the experience of red which one receives through the excitation of the retina is a simple visual sensation. The sensation which is received through the ear from a vibrating string or rod is a sensation of sound. Sensations are classified according to the organs through which they are received. The popular classification into five types of sensations is technically to be increased by the addition of certain classes of sensations not commonly recognized, such as organic sensations, muscle sensations, joint sensations, etc.

A sensation is commonly treated in psychological literature as a simple element of experience, incapable of analysis. It is universally recognized as having quality and intensity. The quality of a sensation of red is its characteristic redness, as distinguished from the greenness of a second visual sensation, or the pitch of an auditory sensation. The quantity of the sensation, or its intensity, depends upon the strength of the external stimulation and the receptivity of the organ of sense. Thus, a loud sound gives rise to a stronger sensation than a faint sound. A bright light gives rise to a stronger sensation than a dim light. Certain writers have treated other characteristics of sensation as fundamental; so James regards duration and extensity as fundamental qualities of sensation. A sound sensation, says James, has three dimensional characteristics. The later development of space perception is merely the outgrowth of this fundamental property of sensations. In the same way the recognition of time is due to the fundamental property of duration which attaches to every sensory quality. Other writers regard extension and duration as derived characteristics which appear only when sensations are united in more complex mental states. (See Space and Time.)

The analysis of consciousness which justifies the scientific student in regarding sensations as simple elements of experience is a theoretical analysis. It is impossible to isolate in consciousness a single sensation. Thus, when one gets the sensation red he always has a background of contrasting color sensations of some type present in consciousness as a background for the sensation of red. Not only so, but all of the other senses are contributing at the same time in some measure to the content of experience. The selection of red or any other single quality as a fundamental element of mental life depends therefore upon a comparison of many experiences in which the given quality recurs. In some of these experiences the color analyzed out is related to black, in others to green, etc. Students of structural psychology lay great stress upon the analysis of consciousness and the complete listing of all sensory qualities. Students of functional psychology, on the other hand, are more interested in the relations which may arise between sensations and the relation of sensory processes to reactions. They therefore give less attention to the enumeration and description of all sensory processes. C. H. J.

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SENSATIONALISM. — A theory of knowledge in accordance with which knowledge is obtained through sensations, and in ultimate analysis consists simply of the qualities and elements revealed in sense perception. Sensationalism has been a natural offspring of empiricism (*q.v.*) in most of the forms in which empiricism has been held. Many of the most influential of empiricists were not themselves sensationalists, however: witness Francis Bacon and John Locke. Some of their successors have given their theories a sensationalistic turn, however, and their rationalistic opponents have seized upon this interpretation as proof that empiricism finds its *reductio ad absurdum* in sensationalism. The most coherent and complete sensational theories were formulated in the later part of the eighteenth century and the early nineteenth century, by Condillac and Helvetius in France and James Mill in England.

The strong and the weak points of the educational counterpart of sensationalism are the same as those of the strictly philosophic conception. The insistence upon sense training, and the substitution of perception of objects for memorizing verbal formulæ has been of great help in getting instruction away from empty generalities, which, although labeled rational and logical, were either meaningless to the pupil or else were accepted by him on external authority. Sense training for its own sake, however, as an end-all and be-all becomes a formal gymnastic, or else ends in the accumulation of meaningless particulars.

J. D.

SENSE INSTRUCTION. — See Object Teaching; also Activity; Concrete and Abstract; Sense Training.

SENSE ORGAN. — See Nervous System.

SENSE REALISM. — See Realism; Realistic Movement in Education; Object Lesson; Sense Training.

SENSE TRAINING. — It is a well-known psychological truth that all intellectual development begins with and is based on perception. Each sense brings us a knowledge of the external world which can be obtained in no other way, and all the so-called higher intellectual processes, such as memory, conception, judgment, and reasoning are dependent upon the data given by the senses. Indeed, all our intellectual processes may be said to be engaged in the interpretation and elaboration of the material furnished by the stimulation of the sense organs. Historically, however, this truth has not been always fully recognized. Many thinkers, for example, have held to the theory of innate ideas (*q.v.*), and educational procedure has at times been based upon the view that the educative process is merely the drawing out and development of that which is already in the mind. (See Sensationalism; also Empiricism; Idealism; Pragmatism; etc.)

Information concerning the external world may be obtained either (1) from direct sensory contact with the object or event, or (2) by means of pictures or other symbolic representations, or (3) through the medium of language. Words are like pictures, in that they represent the objects, but they differ from pictures in that they are not like the objects and can, therefore, be truly representative only in so far as they have been connected with the appropriate object in the past experience of the person using them. Even pictures and other symbolic representations presuppose the proper experiences to interpret them on the part of the pupil. Whenever, therefore, instruction is given by words or other means, without an adequate concrete background on the part of the learner it sinks into mere formalism. This is the charge brought against the education of the middle ages by educational reformers like Comenius, Locke, and Rousseau, and the demand for adequate sensory training was the keynote of the work of later great educational workers like Pestalozzi, Herbart, and Froebel. They pointed out that all knowledge is vague, hazy, and indefinite, if not based upon a concrete foundation, and general notions (and with them the higher thought processes in general) are clear and distinct and trustworthy only in so far as the proper sensory foundations have been laid.

In modern times the emphasis upon sense training has taken several different directions. In the first place, it has led to the demand that all the subjects of a course of study should be taught in as concrete a way as possible. Bringing the child, wherever possible, into first-hand contact with the facts, and where this is not possible, using models, pictures, charts, etc., not only are more instructive methods than teaching mere definitions and textbook descriptions, but carry with them an added interest on the part of the pupil. In the second place, the emphasis upon sensory training has taken a more specific direction in the introduction of special courses, like object lessons, nature study, and science, the aims of which have been variously understood. It may not be out of place to point out that sense training cannot properly be said to develop the sense organ, as exercise develops a muscle. Such defects as near- and far-sightedness, color blindness, and defective hearing, for example, cannot be remedied through any system of sensory training. Sense training can mean either (1) enlarging the number of the child's sensory experiences; or (2) increasing the child's capacity for sensory discrimination, that is, his capacity for distinguishing differences of sensation.

In view of the undoubted basal relationship between sensation and all the higher mental processes, it may be taken for granted that it is desirable that the child should have a rich and varied sensory experience from which to draw. All instruction presupposes certain experiences on the part of the child, in the light of which the new knowledge is interpreted. While it is true that the child's mental development before the time of entrance into school has been almost entirely in the direction of acquiring sensory-motor adjustments, careful investigations of the child's knowledge on entering school shows that it is not safe to take for granted that the child has the proper background of experience for thoroughly understanding the instruction of the school, which tends away from the concrete in so far as much emphasis is laid upon language. It cannot be taken for granted, for example, that the child has had the necessary experiences to understand the reading lessons. This is the largest justification for the introduction of some method of supplementing the child's exerience through first-hand contact with concrete objects. Whether this is done in formal object lessons or in some other way, it must be remembered that the sensory impressions are but one part of the process. The form of response is quite as important, not only because in adopting the proper behavior towards an object new groups of sensations (especially touch and movement sensations) become prominent, but also because no object can be properly said to be "known" until it has elicited the proper form of motor response.

Sensory discrimination is also relatively undeveloped in the child, and, indeed, usually remains so even in the adult, except in those cases where the exigencies of life bring about special training in some particular sphere. The child's ability to distinguish spatial and temporal relations is especially weak. It is a well-known fact that all the senses are capable of high degrees of training in these respects. On the other hand, it is a palpable error to suppose that all the senses should be equally highly developed. A highly developed sense of smell, for example, would probably work more disadvantageously than otherwise for most persons. It would be unwise either to attempt to give to children all the possible sensory experiences or to train their sensory discrimination equally in all directions. Mental development proceeds by a process of selection and emphasis of those features of a situation which are important for the purpose at hand, and a high degree of intellectual capacity may be built up on the basis of sensory experiences which are in some respects quite limited as in such cases as those of Helen Keller and Laura Bridgman. E. H. C.

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SENSIBILITY. — This term is used in several different senses. In its most general sense it is equivalent to affection or primary feeling. It is also used as the abstract term corresponding to sensation. In this sense it is, therefore, the capacity for experiencing sensations. In a more popular sense it is used to denote susceptibility to emotional states. E. H. C.

See Emotions; Sensation, etc.

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SENSIBILITY, DISORDERS OF. — See Abnormal; Anesthesia; Hearing; Smell; Taste; Touch; and Vision.

SENSORY-MOTOR. — See Nervous System.

SENTENCE BUILDING. — See Reading.

SENTENCE METHOD. — See Reading.

SENTENCES. — See Scholasticism; Universities.

SENTIMENT. — Both popular and psychological usage of the term sentiment is loose, and definitions vary considerably. The most general meaning is that of a class of mental phenomena of the same general nature as emotions, but characterized by a higher degree of ideal consideration and a less intense affective tone. In this sense there are four great classes of sentiments, viz. intellectual or logical, ethical, æsthetic, and religious. It is probable that the organic reaction accompanying the sentiments is of the same nature as in the case of emotions, but of less intensity.

Another use of the term introduced by Shand and extended by McDougall, and in some respects more in accord with popular usage, identifies sentiments with those systems of organized emotional dispositions like love and hate which, while they involve primary emotional attitudes, yet differ from emotion in being as more or less permanent tendencies which are manifest even in the absence of the exciting object. E. H. C.

See Emotions.

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SERVIA, EDUCATION IN. — Servia, a kingdom of about 2,750,000 inhabitants, with an area of 18,782 square miles, is a surviving portion of the ancient Servian Empire destroyed by the Ottoman invasion in the fourteenth century. Servian racial elements and institutions, including the system of education, are found in other nations, notably: Montenegro, Austria-Hungary (particularly Bosnia and Herzegovina), and Turkey (Old Servia and Macedonia). All together there are about 7,000,000 Serbs under the authority of the Greek church. Servia became autonomous under Turkey in 1830 and attained independent national existence by the Treaty of Berlin in 1878.

Before and after the Ottoman invasion, Servian education was essentially religious, the only schools being convents. This system still prevailed at the close of the eighteenth century, and has left an undeniable impress on Servian education even in recent times. During the long period of revolution, started in 1804 to free Servia, various attempts were made to inaugurate a public school system. There was a minister of public instruction in 1811 and again in 1837, and a school fund was established in 1841. In 1863 there were 318 primary schools with 388 teachers and 15,563 pupils; girls' schools existed only in the larger towns, and it was extremely difficult to secure teachers. The commissioner of education in 1876 reported 507 primary schools. In 1882 there were 600 schools, with an average attendance of 10 per cent. There were two normal schools, one at Belgrade, with 143 students, the other at Nish, with 53.

Servia's unfortunate geographical position in the Balkan Peninsula has tended to make progress toward a national educational system slow at best, but distinct improvement has been made. Modern Servia's school system is based mainly on the laws of 1882, 1898, and 1904, the chief provisions of which are given below. It should be observed that this legislation represents rather an educational program than an accomplished fact. According to the 1910 census 17 per cent of the population could read and write. Education is provided for both sexes, but a preponderating proportion of the children attending school are boys.

Law of 1882. — The essential features are as follows: Primary instruction was reorganized. Subjects of study were religion; Servian language (also old Slavonic); geography; history, both Servian and general; drawing and penmanship; singing (church hymns); gymnastics; manual training (for girls' schools only). The primary school has six classes: lower primary, I–IV; upper, V–VI. In communities where there are no upper classes, continuation schools must be provided. Length of school year is from August 6 to end of June. Several communities may unite to form one school district. The school commission of the district is to consist of the head of the political government of the place where the school is located, or of the teacher if there is no local mayor, together with a delegate from each of the communities forming the school district, or two delegates if there is but one community. School commissions are required to draw up a list of children of school age. Education is compulsory for six years. Parents are held responsible for the regular attendance of their children, and in the continuation schools employers are held to the same accountability for their employees, the school commission being empowered to levy fines both on parents and employers for non-attendance of the children. Children who enter secondary schools and certain special schools are exempt from six years' attendance in the primary schools, provided they remain at least two years in the more advanced schools. After ten years of service, and in case of disability from old age or sickness, the teacher may retire on 40 per cent of his salary. An increase of 2.4 per cent will be paid in pension for each additional year of service, up to thirty-five years, when the teacher may retire on full pay.

The law of 1898 provided as follows: (1) Kindergartens to be established, especially in those localities where the spoken dialect differed materially from the written language. (2) Four classes in the elementary school, and instead of the two upper classes, vocational schools of three years' duration to be opened, for both boys and girls. (3) Manual training added to the curriculum of the boys' schools. (4) Special local district committees to be elected to have charge of the school buildings and teachers' salaries. (5) Normal school graduates after two years' experience to take a practice examination before becoming regular teachers eligible for promotion. (6) Teachers' salaries raised at the end of five-year periods. (7) Women teachers to receive less salary than men, and to leave the service if they marry — unless they marry teachers. (8) Teachers' salaries no longer to be paid out of the state treasury, but out of the funds of the cities and school districts themselves. (9) Teachers to hold their positions without change in those schools where they were first appointed. (10) A regular system of school inspection introduced; inspectors to be normal school teachers and teachers in the gymnasia, or experienced elementary school teachers.

The 1904 law divides elementary instruction into kindergarten, elementary schools, and continuation schools. Elementary instruction is compulsory and free. Special vocational schools may be established — agricultural schools in the rural districts and business and commercial courses in the cities. Ages for school attendance are: kindergarten, 4–7; elementary schools, 7–13. Places joining together to establish a common school may borrow funds from the state for that purpose. Pupils taught in private schools or at home must pass a state examination at the close of each school year. If a school district has no special lodgings for the school teacher, it must add 30 to 80 dinars (francs) to his monthly salary for rent. Length of school year is from September 1 to end of June. Requirements for teachers are: Servian nationality, diploma of licentiate in letters or of a normal school, and a maturity examination. Special professional courses for the use of the primary teachers are to be provided by the state. The initial salary is 800 dinars, with increase of 250–400 after fourth or fifth year for men, and 250–350 for women, so that the maximum at the end of 27 years is 3000 for men, and 2550 for women. The provision of the 1882 law covering retirement on 40 per cent after ten years is reaffirmed, and the annual increase is raised to 2.72 per cent. Married women teachers may remain in the service. Any year in which a teacher is graded "unsatisfactory" will be left out of account in reckoning years of service. Teachers cannot lose their positions except for proved crime, or for the good of the service, *i.e.* school closed or classes combined for lack of pupils. Wherever possible, boys are to be taught by men teachers and girls by women.

Statistics. — The budget for education in 1910 was 8,189,950 dinars, as opposed to 6,778,227 dinars for 1909. Of this amount 3,874,000 was for primary instruction. There are now 1305 primary schools, 1151 for boys and 154 for girls. In the boys' schools (primary), there are 1462 men instructors and 672 women. The girls' schools have 342 women teachers. The total number of pupils is 135,574, of which 105,471 are boys. The state supports nineteen schools of gymnasium rank, with 368 teachers and 7159 pupils. The state also maintains one "lycée" for girls, with 25 teachers and 158 pupils, and three other secondary schools for girls with 85 teachers and 1323 pupils. The communities themselves support a number of secondary schools. Of these three are "lycées" for boys, with 42 professors and 405 pupils; 12 for girls, with 136 professors and 659 pupils; and two higher institutions for women with 17 professors and 190 students.

As to special schools, the theological seminary at Belgrade has 27 professors and 343 students; there are two normal schools for teachers of boys, one at Yagodina and the other at Alexinats, with 25 teachers and 237 students; two girls' normals, one at Belgrade and the other at Kragujevats, with 31 instructors and 224 students; there is a music school at Belgrade. Other institutions include a school of decorative arts, a military school, and several technical and agricultural institutes.

The University of Servia at Belgrade, founded in 1838 and reorganized in 1905, has faculties of theology, philosophy, law, medicine and engineering. It has 86 professors and 902 students, of whom 46 are women.

W. C. R.

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SERVICE. — See Value.

SERVICE, TRAINING OF TEACHERS IN. — See Teachers, Training of.

SESSIONS, LENGTH OF. — The length of the school day and the distribution of the school period vary greatly in different countries. In a large part of this country it is customary to have two sessions, one beginning at nine o'clock and continuing perhaps until twelve, the other beginning at one or two o'clock and continuing until four P.M. In many high schools especially in the large cities, a single session is held continuing perhaps from eight-thirty in the morning until one o'clock. The relative advantages of one session as against two have been warmly discussed, and some experimental studies bearing on the problem have been made. The question is relative to many conditions, for example, the distance the children have to travel in coming to school, the customary time of having the midday meal in the community, the opportunities for lunch at the schoolhouse, the conditions in the homes of the children favoring study at home or for play out of doors and other extra-scholastic occupations.

The total length of the school period also should vary according to local conditions, the age of the children, the school occupations, and the like, especially according to the amount of home study needed and required. The total time devoted to school work, both in the home and in the school, should not exceed three hours for children in the elementary grades, and seven or eight hours in the upper grades of the high schools. The tendency is to have most of this work in the schoolroom.

Many students have attempted to adapt the school work to what seems to be the diurnal curve of energy. Many experimental studies of fatigue have thrown light on this problem, but no satisfactory determination of the curve of work or energy has been made. In fact it is impossible to do this except in a general way, since there are such individual differences. There are perhaps several types as regards ability to work. Among mature students Kraepelin found two distinct types: *Morgenmenschen*, morning men, those who do their best work in the morning; and *Abendmenschen*, evening men, those that do their best work at night. Whether or not there are such types among children, we do not know; but the generalizations that some have made to the effect that the best work is always done in the morning, or by others that the best work is done in the afternoon are altogether too sweeping. Until further studies have been made it seems wise, however, to follow the general verdict of observation, also corroborated by the general evidence from experimental investigation, which indicates that the morning hours are the best for intellectual work, and that manual training, physical exercise, and the like may well be placed in the afternoon. Experimental studies have shown clearly that physical exercise, especially gymnastics and such physical exercise as that involved in singing and the like, are by no means to be regarded as recreation, but that they exhaust the energy and in case of fatigue are likely to increase rather than diminish it.

The proper length of the school period and the distribution of the work depend also very largely on the hygienic conditions of the schoolrooms as regards ventilation, temperature, humidity of the air, and the like, and upon the number and distribution of the recesses, the kind of teacher employed, as well as the character of the tasks.

In the present state of our knowledge, the following points seem to be important: —

1. The total length of the period for school work both in the school and at home should not be more than three hours for pupils in the elementary grades and not more than seven or eight hours in the upper grades of the high school.
2. The problem of one session or two and of the amount of time to be spent in the schoolroom is relative to local conditions in the community on the one hand, and the hygienic condition in the schoolroom on the other.
3. The usual hour for beginning school work in this country, that is, not earlier than eight o'clock in the summer and nine o'clock in the winter, seems to be a good one.
4. It is especially important to provide ample time for recess, not less than that required in Berlin, one hour for a five-hour session, this distributed into one long recess of twenty minutes and several short recesses.
5. There is a general consensus that the more difficult and more intellectual tasks — arithmetic, mathematics, and the like — should come in the morning hours, and the manual training, gymnastics, and the like should be placed in the afternoon.
6. The great individual differences in regard to the curve of work and susceptibility to fatigue make it desirable that the plan for the period of study should be flexible and give as much opportunity as possible for adaptation to individual needs. W. H. B.

See FATIGUE; HOME STUDY; SCHOOL MANAGEMENT, etc.

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SEVEN LIBERAL ARTS. — See LIBERAL ARTS.

SEVILLE, UNIVERSITY OF, SPAIN. — See SPAIN, EDUCATION IN.

SEWARD, THEODORE FRELINGHUYSEN (1835–1902). — American apostle of the tonic-sol-fa method of teaching music; was educated in the public schools of New York and studied music under Lowell Mason (*q.v.*). He was instructor of public school music in Connecticut, New York (Teachers College, 1887–1896), and New Jersey. He became interested in the tonic-sol-fa system of teaching music and devoted his last years to its popularization in the United States. He was the author of many sacred and secular musical works, and joint author with Lowell Mason of *The Pestalozzian Music Teacher.* He was editor of the *New York Musical Pioneer,* the *New York Musical Gazette,* and the *Tonic-sol-fa Advocate.* W. S. M.

See MUSIC.

SEWING. — See HOUSEHOLD ARTS.

SEX AND EDUCATION. — See ADOLESCENCE; COEDUCATION; SEX HYGIENE; TEACHERS, SEX OF.

SEX HYGIENE, INSTRUCTION IN. — **Necessity of treating the Subject.** — The obligation to abandon the policy of silence on the subject of sex has been urged upon the teaching profession chiefly by physicians who are compelled to repair the ravages of venereal diseases. Simultaneously in several nations of Europe and in America medical men have sought the aid of teachers and philanthropists to assist them in the conflict with maladies which afflict the innocent and threaten coming generations. This call of authorized experts it would be base and disloyal to ignore. Even if physicians are inclined to lay too great emphasis on the physical factors of the problem, they are most competent to reveal the significance of the aspect which appeals to them. With the anatomical, physiological, pathological and hygienic problems involved we cannot here adequately deal. To physicians we must leave the task of healing diseases. The educational factors at present concern us. By education is meant much more than instruction. Ignorance is one cause of disease and weakness, but it is not the only cause. Inherited tendencies, vicious examples, crowded habitations, unwholesome habits, alcoholism, and various other elements must be taken into account, and the effects of these factors in morbid appetites and passions are not to be removed simply by giving information. At the same time the members of the teaching profession, both in the school and as leaders of thought, may help to improve the conditions which influence character.

A merely negative attitude on the part of school authorities is impossible, because the charlatans and panders persistently and aggressively invade our schools and circulate printed stuff which is veritable moral poison. The mercenary, organized and avaricious destroyers of our children and youth must be actively fought. While superintendents are passive, the enemy is alert and unscrupulous. It is not a question of leaving the minds of youth "innocent." In modern cities, and often especially in the country, the information about sex comes from corrupt sources; it rarely fails to reach inquisitive children in some way. We must furnish the truth, or the children will be taught falsehood, while it is vainly imagined that they are secure.

Method. — It is, then, a problem of method. Long neglect of the subject has forced sober men to radical and fragmentary efforts and given sentimentalists and mercenary book peddlers a free field. The wisest method would never admit a special pamphlet, book, or lecture on this particular theme. With the best intentions any one who instructs child or adult on sex as a separate subject makes it relatively too prominent and isolates it from its natural connections. The central principle of right procedure may tentatively be formulated thus: *All the normal questions of life should be answered in the interests of the growing person with the simple truth as they arise.* With this we do not discover the most effective agency, but only the essentials of the process. The questions asked by young children, under ordinary wholesome conditions, relate to the origin of babies. The other phenomena of reproduction and the functions of male and female, are usually matters of later inquiry.

The modern curriculum from kindergarten to university and especially in the "continuation schools" offers several natural lines of approach to our theme: biology (nature study), physiology, athletics, and moral instruction. In the studies of plants, animals, and the human body, the facts of reproduction may be presented before any special salacious interest can be aroused. In the physical exercises and the hygienic training connected with them, a wise teacher has an opportunity of giving the desirable directions about diet, dress, bathing, outdoor life, and occupation, without particular reference to sex. In the morality lessons, whether on the basis of the Decalogue or any other summary of human virtues and duties, the teacher cannot pass over the relations of sex.

Agencies. — The teacher is inclined to lay all responsibility on parents, and is partly right. Rousseau gave his Emile a tutor only in order that the son of Emile might not need a tutor. So far as the social problem is one of education the teaching profession must take the initiative and at least offer to help the parents with both knowledge and method. At present few parents know how to perform their duty. This policy of beginning with parents is already upon its trial; various school boards and societies of social hygiene have called parents together and given physicians an opportunity of preparing their minds for this serious and delicate duty. This seems to be the best place to begin, because it is so obviously suitable; the schoolhouse is public property, the subject is distinctly educational and the physician is a recognized authority.

Parental Coöperation. — Experience has shown already that a tactful approach to parents will meet with favorable response. In some places a physician has been invited to address mothers and daughters, or the lads, at the time when temptation begins to be acute and when most children of our industrial communities go to work. The objection to this course is that it calls special attention to the topic, gives it overemphasis, and takes it out of its natural relations to other subjects. The main point here is to lay the responsibility on as many parents as possible and offer the help of the school authorities, if desired. In the present situation it is rarely safe to give instruction in matters of sex without first securing parental consent and coöperation; although some teachers, through nature studies, have taught children and youth all that is necessary without raising discussion. When there is laboratory work in biology this is sure to become more general. Meetings of parents with teachers afford excellent opportunities for securing such coöperation.

The Gang and the Camp. — In recent years, and under the guidance of eminent psychologists and educators, the conduct of boys in groups has been studied. It has been found that the worship of force and vitality is an essential part of a boy's religion. In the outdoor sports of lads, and especially in tramps over the country and by camp fires, a wholesome and genial man can utilize the racial reverence for life and force to demonstrate the value of clean thoughts and ways. When the municipal playgrounds are removed from the police and the politicians, and have become an integral part of the educational system, the teachers can vastly extend their influence over boys and young men. What is now done in groping fashion by a few specialists for sons of the rich or as a charity for a few poor lads, will be done for all as a necessary part of preparation for citizenship. Then male teachers will have a full opportunity to become the councillors of lads and can aid them in a way young women teachers can never do.

The *Report* of the Vice Commission of Chicago urged the board of education to investigate the advisability and methods of teaching social hygiene to the older pupils in the public schools; to provide vocational training in continuation schools for girls between the ages of fourteen and sixteen; to extend the use of public schools as social centers; to keep school grounds open for children, always under close supervision. This does not go far enough. The attendance agents of schools should be given legal authority, under the board of education, to see that all youth are either in school or at some suitable and useful occupation until they are nineteen years of age. The English "hooligan," the Parisian "apache," and the American ruffian are not the products of the schools but of tolerated idleness and of neglect by parents and school authorities during the most dangerous period of life.

Eugenics. — Children learn quite early and naturally that offspring of plants, animals, and men resemble the parents. Likeness is so apparent that it is taken as a matter of course. In simple nature lessons, with the help of a garden, the Mendelian laws can be made familiar to young persons. The inheritance of weakness and some forms of disease can be made clear and its importance explained. When birds, cats, dogs, and other pets are owned the pedigrees can be made the basis of lessons in eugenics. Experience has shown that boys can be made to realize that their own self-control and clean living will affect their children, and examples of failure and misery are only too abundant for the illustration of the sorrows entailed upon posterity by dissolute and feeble fathers and mothers. At the right time in youth these biological truths are very impressive with boys, if properly presented. (See Eugenics.)

Normal Schools. — It follows from the primary obligation of teachers as professional experts in method that the training schools for teachers should prepare at least selected teachers for this task, both for their own protection and for public utility. In France the supreme educational authorities have adopted a policy of giving instruction in "puericulture" and are providing courses in normal schools to meet the needs of teachers. Here again thorough training of teachers is necessary by the laboratory method in botany, zoölogy, general biology and hygiene, rather than special lessons in matters of sex. C. R. H.

See Biology; Eugenics; Hygiene, Personal; Physiology; Moral Education.

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SEXAGESIMAL FRACTIONS. — See Fractions.

SEXES, SEPARATION IN THE SCHOOL. — See Coeducation.

SEXUAL DIFFERENCES AND ANOMALIES. — The general social consciousness regarding the sexual organs, sexual relations, etc., has developed in such a manner that except in a scientific way the facts are not understood or are misinterpreted or misrepresented, and except in the lower strata of society discussion of these matters is tabooed. In both mental and physical life the sexual element plays a much larger part than most people are willing to admit or even to believe. The investigation of the psychogenic origin of certain mental disorders demonstrates this for the mental side beyond the possibility of question, and statistics of hospitals and of clinics show the importance on the physical side.

The sexual characteristics may be divided into the primary and secondary. The primary are those anatomical and physiological characteristics which deal with the reproduction of the species. The secondary of an anatomical nature are mainly those of size and general contour of the body, the female having a shorter stature, more rounded form, less bodily hair, but more hair on the head than the male; those of a physiological nature are evidenced by the proneness to certain diseases and to resistance against others; and those of mental nature are much more difficult to define. Investigators dispute the alleged facts of each other regarding the mental differences of the sexes, and complications arise from the fact that these differences in mental constitution have been taken as evidence by men of the inferiority of women, though this conclusion is as strongly disputed by women and by some men. To an impartial observer, however, there appears little doubt that there are mental differences, but it does not seem that these can be utilized as evidence of superiority or of inferiority.

The abnormalities, anomalies, and perversions of the sexual character are extremely numerous, and these also are physical and mental.

On the mental side we find all grades of sexual abnormalities, from those in whom the sexual feelings are entirely absent to those in whom these feelings are predominant and constant. Here also belong (*a*) the extreme of prudery, which would prohibit all nude art, and opposed to this, (*b*) an absolute disregard of social custom. On the other hand, we also find that instead of the normal liking for the opposite sex, there is sometimes an unnatural mental gratification from the association with the same sex (inversion).

All these sexual disturbances or anomalies are found commonly among the abnormal classes. It is said that of idiots over one third exhibit differences in the sexual organs and the percentage among criminals is almost as large. The percentage among the insane is smaller, although in past times a sexual etiology was given for many of the mental diseases.

The importance of these matters in school life cannot be exaggerated. Many a boy or girl has been initiated into abnormal sexual practice at an early age because of association with perverts, and practices which have been learned have led to grave mental disorders later in life. This is particularly true in regard to the genesis of certain of the functional psycho-neuroses, *e.g.* the phobias, states of anxiety, etc. Suspicion or evidence of any of the forms of anomalies mentioned in this article should be communicated by the teacher to the parents (if they be intelligent) or to the school physician, both on account of the welfare of the individual, and also on account of the general class or school morality.

S. I. F.

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SEXUAL PATHOLOGY. — See SEX HYGIENE, INSTRUCTION IN.

SHADES. — See COLOR OF WALLS; LIGHTING OF SCHOOLROOM.

SHAFER, HELEN ALMIRA (1839–1894). — President of Wellesley College; was graduated from Oberlin College in 1863. She taught in the high schools of St. Louis from 1865 to 1875, was professor in Wellesley College from 1877 to 1888, and president of the college from 1888 to 1894, succeeding Alice Freeman Palmer (*q.v.*). W. S. M.

See WELLESLEY COLLEGE.

SHAKESPEARE AND EDUCATION. — Although we do not find, as is but natural, any direct and specific handling of education as a subject in the works of Shakespeare, yet there are so many allusions to its advantages and its effects, and, incidentally, to its methods, as to render it not doubtful at all that the science must have interested the dramatist greatly. As an example of the effects of education in detail, Hamlet asserts that that training he had had in fair writing, which he had endeavored to forget, did afford him at a pinch "yeoman's service," and in *Twelfth Night*, Sir Andrew Aguecheek laments that he did not

> "Bestow that time in the tongues that I have in fencing, dancing, and bear-baiting: O, had I but followed the arts!"

That, however, this lofty view of the advantages of education was not the view which was held by all at that time, Shakespeare humorously makes us realize in the play of *Henry VI*, where the rabble rebels proceed to hang the clerk of Chatham with his pen and inkhorn about his neck because "He can write and read and cast accounts" and because "We took him setting of boys' copies." And Lord Saye is also doomed to execution because he has "Most traitorously corrupted the youth of the realm in erecting a grammar school. And whereas before, our forefathers had no other books but the score and the tally" (the tally being a little wooden block for keeping accounts), "thou hast caused printing to be used . . . it will be proved to thy face that thou hast men about thee that usually talk of a 'noun' and a 'verb,' and such abominable words."

It is evident that Shakespeare's conception of a real education was a broad and wise one, and that he realizes the distinction between mere learning and the acquisition of character and power. For in *Love's Labour's Lost* we read: —

> "Study is like the Heavens' glorious sun,
> That will not be deep-searched with saucy looks;
> Small have continual plodders ever won
> Save bare authority from others' books."
>
> "So study evermore is overshot;
> While it doth study to have what it would
> It doth forget to do the thing it should."

And in other passages he shows his contempt of pedants and pedantry, as in the case of Sir Hugh Evans, the schoolmaster in the *Merry Wives of Windsor.*

Of the worldly results of thorough education united with talent Shakespeare gives a clear statement in the lines in *Henry VIII*, where Wolsey is referred to as having his "training such that he may furnish and instruct great teachers and never seek for aid out of himself."

It should be noted that this care in the matter of education was not confined to men only, and it is evident from several references in plays that Shakespeare took a liberal view of the education of women; all his heroines are well educated and clever.

Shakespeare further gives us some insight into methods of education at that time. In *The Merry Wives* the boy William is put through his Latin paces, and we find his grammar lesson very much of the same caliber as was common in our schools thirty years ago, and is so still in many of them, with the exception that the grammatical terms are referred to in Latin and not in English. In the play of *Henry V* we have evidence that some of the methods that are now recognized as good seem at least to have been practiced then. The French Princess Catherine desires to pick up a slight acquaintance of French, and to do so she enumerates various parts of the body in the foreign tongue in a very similar way to that in use now. The importance of interest as a factor in education is mentioned in *The Taming of the Shrew*, in a passage where the poet, after speaking of a number of the usual studies, continues: —

> " Fall to them as you find your custom serves you,
> No profit grows where is no pleasure ta'en."

Some information can also be obtained here and there of the different types of schools which prevailed in Shakespeare's time. Frequent reference is, of course, made to private schools and tutors, but in the *Two Gentlemen of Verona*, *Henry IV*, and *Henry VIII* mention is made of grammar schools, of Ipswich School, and of Oxford University. Of universities in general, the poet speaks of them as "studious," as places where one becomes a good scholar, or else as in *The Taming of the Shrew* as places where " one may spend all." After the university course came professional education, and in *Henry IV* the good scholar, after studying at Oxford, passes on to complete his law education at the Inns of Court (*q.v.*), while in *All's Well that Ends Well* colleges of medicine are referred to.

On the whole, while no general theory of education can be evolved out of his plays, Shakespeare does recognize both the true ends of education and the difficulties to be surmounted in attaining them. For he makes Portia say:

> "If to do were as easy as to know what were good to do, chapels had been churches, and poor men's cottages princes' palaces. It is a good divine that follows his own instructions: I can easier teach twenty what were good to be done, than be one of the twenty to follow mine own teaching."

Study of Shakespeare. — Great though the influence of Shakespeare has been on English language and thought, it was for a long time indirect, owing to the predominance of the classics. English and therefore the study of Shakespeare could find no place in the schools. The first school edition of Shakespeare was not published until 1752. This was the *Beauties of Shakespeare*, in two volumes, selected by Waller. Where this book was not used, special passages were often selected by the teacher and dictated to the pupils to be learned by heart and studied with special reference to linguistic and rhetorical effect.

In a work by Carpenter, Shepherd, and Joyce, published in 1817, and obviously intended as a modern handbook, Shakespeare is referred to especially as affording examples of grammar and devices of rhetoric, and the author is quoted as expressing and giving a model for the finest intensity of dramatic emotion, but there is not the reference to Shakespeare as affording a complete subject for separate study which we now observe in modern education.

During the earlier part of the nineteenth century we find publication of one or two other collections of the beauties of Shakespeare and many editions especially for the stage — proof that his direct influence on education was increasing considerably; and the growth of special Shakespearean societies and circles in different parts of England for the publishing of studies upon his works or for giving readings of his plays is another evidence of the same process. Coming down to later times, in the curricula of the University of London, while a large study of classics is prescribed for every examination for the arts degree (since the foundation in 1845), it is not till 1859 that a work of Shakespeare is given as a special subject to be read, and that only for the first examination for the B.A., the play selected being *King Lear*. Henceforward Shakespeare figures in the London examinations, but it was not for many years that his works appeared in the final examination for the Arts Degree.

Since about the middle of the nineteenth century and the publication of the report of the Royal Commission in 1864, the study of Shakespeare has increased very much throughout the country, as is evidenced by the appearance of separate editions of his plays with notes and introduction. From that time onward the study of Shakespeare in educational institutions has been greatly augmented, together with students' editions of his works, so that now there is scarcely a school in England where one of his complete plays does not form a portion of the curriculum.

For purposes of education his plays present an admirable field. Their diversity of plot, their intense human interest, with variety of scene and situation in almost all, their noble language and witty dialogue, give infinite scope to pedagogic effort. Of the fifteen comedies, *The Merchant of Venice*, *Midsummer Night's Dream*, and *The Tempest* are those which usually find most favor with the young student; of the seven tragedies, *Hamlet* and *King Lear* are often selected. In addition to these is the wonderful galaxy of historical plays, English and Roman; of these respectively, *Henry VI* (three parts), *Richard III*, *Richard II*, *King John*, *Henry IV* (first and second parts), *Henry V*, *Henry VIII*, *Coriolanus*, *Julius Cæsar*, *Anthony and Cleopatra*. Their study is found to be a powerful adjunct toward vividness of impression in the teaching of history. It is hard to say which has been found most useful in the direct field

of education; *Henry V* and *Julius Cæsar* are perhaps the most often read. H. O.
See LITERATURE, ENGLISH.

SHALER, NATHANIEL SOUTHGATE (1841–1906). — Dean of the Lawrence Scientific School of Harvard University; graduated from the Lawrence Scientific School in 1862 and served two years as an officer in the Union army during the Civil War. He was instructor in the Lawrence Scientific School from 1868 to 1872, and professor in Harvard University and dean of the Lawrence Scientific School from that date until his death. His publications include *First Book of Geology, Story of Our Continent, Interpretation of Nature, The United States of America*, and many scientific works. W. S. M.

SHAME. — A painful emotion of self-abasement in view of the real or supposed ill opinion of others. This emotion, together with shyness, bashfulness, coyness, and modesty, to all of which it is closely allied, seems to have its root in a primitive instinct of self-abasement, which expresses itself in a general diminution of muscular energy, hanging down of the head, the blush (in man), and so forth. Shame proper implies self-consciousness on the part of the person experiencing it, though the instinctive tendency in its primitive form is present in the lower animals and young children.
See EMOTIONS. E. H. C.

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DARWIN, C. *Expression of the Emotions*, pp. 353–367. (London, 1900.)
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SHARP. — See MUSICAL NOTATION.

SHAW, EDWARD RICHARD (1850–1903). — Dean of the School of Pedagogy of New York University; graduated at Lafayette College in 1881. He was instructor at Greenport, N.Y., 1881–1883; principal of the Yonkers High School, 1883–1892; professor in New York University, 1892–1895, and dean of the School of Pedagogy of New York University, 1895–1903. His publications include *School Devices* (1891), *Studies in Education* (1899), *School Hygiene* (1901), and various papers on educational subjects.
W. S. M.

SHAW UNIVERSITY, RALEIGH, N.C. — An institution for the education of young men and women of the colored race. There are eight departments: industrial, teaching, scientific, liberal arts, theological, law, pharmacy, and medical. The requirements for admission to the classical, scientific, or pedagogical courses are the corresponding preparatory courses or their equivalent. The degrees of A.B., B.S., B.Th., Ph.S., and M.D. are conferred. Of 549 students enrolled in 1910–1911, sixty-seven were in the collegiate department. The college faculty consisted of eighteen members.

SHEFFIELD, UNIVERSITY OF, SHEFFIELD, ENGLAND. — One of the recently founded English universities, receiving the royal charter in 1905. The university was organized out of the existing University College which had been founded in 1897 by the union of Firth College (*f.* 1879), the Sheffield School of Medicine (*f.* 1828), and the Sheffield Technical School (*f.* 1884). Like other municipal universities of England, the University of Sheffield stands in intimate relation to the life and needs of the town and neighborhood. The supreme governing body is the court of governors, on which there are representatives of a number of local authorities; the council is the chief executive body; and the senate has charge of the academic matters of the university. The following faculties are maintained: arts, pure science, medicine, law, and applied science. In the last named faculty, the department of metallurgy with its laboratories for iron and steel, the industries of the town, and the degrees in metallurgy, need special mention. Besides the faculties there is a department of education for training elementary and secondary teachers, for which a grant is received from the board of education. Students working for the degrees of B.A. and B.Met. may take their work partly in day and partly in evening courses, but under this arrangement cannot graduate in less than five years. The university as a member of the joint matriculation board has power to examine and inspect schools. It is also represented on the education committees of several local authorities. Through a committee of council the university also conducts a number of extension courses. The university draws its income from endowments, fees, and grants from a number of local authorities, from the treasury and from the board of education. In 1910 there was an enrollment of 885 day and 1225 evening students, with a faculty of 151 members.

Reference: —

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SHELDON, EDWARD AUSTIN (1832–1897). — First principal of the Oswego Normal School and originator of the Oswego movement (*q.v.*); was born at Perry Centre, N.Y., Oct. 4, 1823. He entered Hamilton College intending to prepare for the profession of law, but poor health compelled him to give up his collegiate studies at the end of the third year. In 1848 he took charge of a Ragged School (*q.v.*) at Oswego, N.Y. It was composed of "one hundred and twenty rude and untrained Irish boys and girls between the ages of five and twenty-one years."

Mr. Sheldon was superintendent of the schools of Syracuse from 1851 to 1853, after which he returned to Oswego to organize a free public school system for the town. Twelve years of effort to train the teachers under his supervision and give them some vision of Pestalozzian methods led in 1861 to the organization of the Oswego Normal School. But the schools of the city under Mr. Sheldon's superintendency had really been training schools, for he had in a large measure eliminated books from the primary schools and "substituted teachers for books."

The institution was at first a city training school, but in 1863, largely through the efforts of Victor M. Rice (*q.v.*), then State Superintendent of Public Instruction of New York, the legislature granted $3000 a year toward its support; and in 1866 Oswego became one of the regular state normal schools of New York. As the aim of the school was to introduce the Pestalozzian methods, Mr. Sheldon secured the services of Miss Margaret E. M. Jones, who had been connected with the Pestalozzian training schools in England, and Herman Krüsi, Jr. (*q.v.*), the son of one of Pestalozzi's colleagues, and an experienced normal school instructor.

Mr. Sheldon gathered striking personalities from Europe and America and held them together for years; and, as an American student of education well says, "he shaped a coherent course of study and turned out a large group of teachers who thought teaching, on Oswego lines, the greatest thing in the world." The emphasis which Mr. Sheldon placed upon object teaching made possible the subsequent introduction of nature study in the schools of the United States. He continued at the head of the school until the time of his death, Aug. 26, 1897.

He was the author of several manuals on object teaching, a series of school readers and spellers, and numerous papers on educational subjects. His *Autobiography* has been edited by his daughter, Mary Sheldon Barnes (*q.v.*) (New York, 1911). W. S. M.

See Object Teaching; Oswego Movement.

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SHELDON, WILLIAM EVERETS (1832–1900). — Educational journalist; educated at Middlebury College. He taught in Vermont; was instructor in the Abington (Mass.) High School from 1853 to 1858, and principal of the West Newton High School from 1858 to 1870. He was associate editor of the *American Primary Teacher* from 1875 to 1900. W. S. M.

SHERWIN, THOMAS (1799–1869). — Educator; graduated from Harvard College in 1825. He taught in the elementary schools of Massachusetts; was instructor and principal of high schools in Boston (1828–1854). He was active in the organization of the Massachusetts Teachers Association and was president of the American Institute of Instruction (1853 and 1854). His publications include *Teaching Mathematics* (1834), *Examples in Teaching* (1818), *Scientific and Classical Studies* (1856), and *Elementary Algebra* (1841). W. S. M.

SHIRREFF, E. — See Women, Education of.

SHOOTERS, ABC-SHOOTERS. — A term applied to the young boys who were placed under the care of the bacchants (*q.v.*), or wandering students, to be taken to good schools or to be instructed by them. In practice the shooters were compelled to beg or to steal food, including frequently the throwing of domestic fowl. The term "shooters" (Germ. *Schützen*) may have arisen from this practice of throwing fowl, or from the slang "*Schiessen*," to steal. As applied to the letters of the alphabet, the meaning is obvious enough.

See Bacchants.

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SHOP WORK. — See Manual Training.

SHORTENED COLLEGE COURSE. — See College, American.

SHORTER COLLEGE, ROME, GA. — A college for women established in 1873 as the Cherokee Female College, the present name being adopted four years later in honor of the chief benefactors of the college. Academic, collegiate, music, and expression departments are maintained. The entrance requirements to the college are fifteen units. The college courses lead to the degree of A.B. The enrollment in 1912–1913 was 267. There is a faculty of thirty members.

SHORTHAND. — See Commercial Education; Secretarial Profession, Education for; Writing.

SHORTSIGHTEDNESS. — See Eye; Myopia.

SHREWSBURY SCHOOL, SHREWSBURY, ENGLAND. — One of the nine great public schools (*q.v.*) of England, founded as a free school at the request of the bailiffs, burgesses, inhabitants, etc., by Edward VI, as the *Libera Schola Grammaticalis Regis Edwardi Sexti.* Thomas Ashton was the first headmaster, but little is known of the work of the school in the first ten years. From 1561, however, the school met with remarkable success through the energy of its headmaster, and within about a year numbered about 266 pupils (sons of burgesses, or *oppidani*, and aliens, or *alieni*). Among the distinguished pupils were Sir Philip Sidney and Fulke Greville. One of the early features of the school was the encouragement of dramatic performances by Ashton, who himself wrote several plays. Under Elizabeth the funds of the school were augmented, and statutes (1571) and ordinances (1577–1578), mainly the work of Ashton, were issued. The appointment of the headmaster was given to the bailiffs, but the right of selection was left to St. John's College, Cambridge, where a number of exhibitions were also founded for the school. The headmaster had by preference to be an old pupil of the school and a burgess of Shrewsbury, a condition unbroken until 1798. The entrance requirements to the school were writing, English, and Latin accidence. A scale of fees was drawn up varying with the rank and domicile of the pupils' parents. "Shootinge in the longe bowe, chesse plaie, running, wrestling, leaping" were the forms of recreation which were allowed. The following schoolbooks were in use: Tully, the *Commentaries* of Cæsar, Sallust, Livy, and two little books of Dialogues drawn out of Tully's *Offices* and *Lodovicus Vives* by Mr. Thomas Ashton for Latin prose, and Vergil, Ovid, Horace, and Terence for Latin verse; while for Greek the books were Clenard's Greek Grammar, Greek Testament, Isocrates, and Xenophon's *Cyropædia*. Ashton was succeeded in 1571 by Thomas Lawrence, who, like his predecessor, was not in orders. The school continued its successful career and at one time numbered 400 pupils, while Lawrence sent 100 boys up to Oxford and Cambridge. Under John Meighen (1583–1635), also a layman, a library, houses for the masters, a new schoolhouse, and a chapel were added. Twice the career of the school was checked by an outbreak of sweating sickness, while further trouble was caused by a dispute between the bailiffs and St. John's College on the question of the appointment of the headmaster. The promise at the beginning of the century was unfortunately not fulfilled. Meighen's success was continued by Thomas Chaloner, but the outbreak of the Civil War and the later Puritan domination were not conducive to stability, and the school gradually underwent an eclipse until in 1798 the old ordinances were repealed by act of Parliament, a new governing body was appointed, and the restrictions on the appointment of headmaster were removed. In the succeeding century the school had but three headmasters, Samuel Butler (1798–1836), Benjamin Hall Kennedy (*q.v.*) (1836–1866), and Henry Whitehead Moss (1866–1908). A new spirit of scholarship was introduced into the school by Dr. Butler, a friend of Dr. James of Rugby and editor of Æschylus. The numbers in the school began to increase, mathematics was taught privately, and studies and method were reorganized. A system of periodical examinations and promotions by merit was introduced, and its effect was marked by the notable series of successes at Oxford and Cambridge. Many of the ideas of Dr. Butler were borrowed and adopted at Harrow and Eton. Dr. Butler was a strong advocate of the monitorial system of government of the boys by præpostors or senior pupils. Life was hard at the school, bullying was rife, and at least two instances of general insubordination are reported. But Dr. Butler's influence was wholesome, none the less. He was succeeded in 1836 by Benjamin Hall Kennedy, the famous classical scholar, who, although he trained many fine scholars, was unable to keep up the numbers in the school, which was condemned by the public school commissioners in 1862 for lack of suitable accommodation. Dr. Kennedy further became entangled in a dispute on the interpretation of the term "free school" (*q.v.*), the inhabitants of Shrewsbury interpreting it in its literal sense. During his headmastership the modern studies, including French and mathematics, were added to the curriculum; games and athletics were encouraged; and an interest in music was stimulated by the establishment of a school choir. Under Rev. H. W. Moss the school was removed to new buildings at Kingsland, on the Hereford side of the Severn, and continued to carry on the high traditions established by the two preceding heads. In 1908 Rev. C. A. Alington was appointed headmaster. The school is divided into classical, modern, and science sides, and special work is given to boys preparing for the army. There were 340 pupils in the school in 1912, of whom 315 were boarders distributed in eight houses. The staff included thirty-three masters.

Reference: —

Fisher, G. W. *Annals of Shrewsbury School.* (London, 1899.)

SHURTLEFF COLLEGE, ALTON, ILL. — A coeducational institution founded in 1827 at Rock Spring and moved to Alton in 1832. A charter was obtained in 1833, and the present name in honor of a benefactor was adopted in 1836. It is under the auspices of the Baptist denomination. Academic, music, and college departments are maintained. The admission requirements are equivalent to the work of a high school. The A.B., B.S., and B.L. degrees are given by the college. The enrollment of collegiate students in 1910–1911 was sixty-three students in the college and forty in the academy. The faculty consists of fifteen members.

SHYNESS. — See Modesty; also Adolescence; Emotions.

SIAM, EDUCATION IN. — Siam is an independent kingdom, bordered on the north by Burma and by French Indo-China which extends, also, along its eastern border, meeting Cambodia, which forms the southeastern boundary. The Gulf of Siam, an arm of the South China Sea, completes the southern boundary and washes the eastern shore of the Malay peninsula which continues the kindgom as a narrow neck of land between the Gulf and the Indian Ocean. The British have encroached upon the west and southwest of the kingdom, and the French upon the east, while the whole area is marked by spheres of influence belonging to one or the other of these two European powers. Add to these influences that of the Chinese who send into the kingdom an ever increasing stream of immigration, and it is easy to realize the nature of the transforming forces and the spiritual collisions to which the kingdom of Siam is subject.

The educational influences of the past have been the ceremonial forms of the autocratic government, the division into social orders, each with its defined sphere of duties and privileges, and the prevailing religions. The great body of the people are Buddhists, and the ethical code of the founder of this faith is everywhere venerated. The Siamese government, however, has always been tolerant of other religions. Moslemism was introduced by Arab merchants, and in the latter part of the seventeenth century a serious attempt was made to convert the entire kingdom to that faith. The Chinese colonists maintain the study of Confucius, but make few proselytes, and Christian missionaries, Catholic and Protestant alike, establish their schools and churches without interference. The first Roman Catholic priests entered Siam in the early part of the seventeenth century in the train of Portuguese settlers; but it was the founding of the French Catholic Mission in the far East and the selection of Bangkok as the site of its headquarters which gave that faith a permanent footing in the country. This religious teaching has not, however, made much progress among the Siamese, and although there are two bishoprics, many churches, and a multitude of priests in Siam, the congregations are composed chiefly of Chinese.

The American Presbyterian Mission has been maintained in Siam since the early part of the nineteenth century, and its members, who are dispersed over the country, gain much influence by their knowledge of medicine which they freely use for the benefit of the people.

Ever since the establishment of Buddhism in the country, a certain amount of instruction has been within the reach of the people. In the monasteries the monks interrupted their studies to impart the elements of reading, writing, and ciphering to boys and young men. Modern education was introduced by Christian missionaries, and after the accession of King Maha Mongkut, who had acquired a taste for knowledge from the American Presbyterian missionaries, the establishment of modern schools was encouraged. This monarch also began the practice of sending boys to foreign countries to be educated. In this way an interest in technical pursuits was excited. In 1891 Prince Damrong was dispatched on a special mission to Europe to study the principles of western administration, and upon his return a department of education was established which later was developed into the ministry of public instruction. From this action dates the school system which the government is now developing. Efforts were first directed to the establishment of elementary schools which were divided into two classes; one very elementary, the other comprising two divisions, one of two years for instruction in Siamese, the other covering a five-years' course in English as preparatory to higher scientific instruction.

After the initial steps had been taken, progress was interrupted by other pressing matters, but lately the system of public instruction has been vigorously promoted. In Bangkok many schools were established, and from this city the work was carried to the interior of the kingdom. The old temples, of which there are about 13,000, have been made the seats of the new schools, which gains them the confidence of the people. A government boarding school for the sons of nobles was established in Bangkok, and under the charge of a staff of English teachers has proved eminently successful. A similar school was opened for young women, and two training colleges for teachers. These were followed by special schools of law, medicine, military training, civil service schools, etc. From statements for the current year it appears that there are 150,000 pupils in the lower primary schools, 8000 in the higher primary, and 1000 pursuing secondary studies, or a total of 159,000 pupils in modern schools under government direction; this number is about 2 per cent of the estimated population, six and three fourths millions. The king has granted two scholarships, each yielding $1500 a year for four years, to be awarded upon the results of competitive examination to students who will pursue some technical branch in European schools. The law school under the Department of Justice has been in operation ten years, graduating about twelve students a year. Meanwhile the mission schools have been greatly extended. The Roman Catholic College of Assumption for boys at Bangkok has over 400 students; the American Mission

School for girls at Wanz Lang, Bangkok, is the largest in the kingdom.

The most important recent addition to the government provision is the technical school established in 1909 under the department of lands and agriculture. It comprises sections of surveying, irrigation, engineering, and scientific agriculture. From the fact that Siam is essentially an agricultural country, great expectations center in this institution.

The provision of a medical institute for researches in bacteriology and serotherapy, and comprising a Pasteur institute, has been recently assured through the combined action of the government and private endowment.

The following government schools are at the capital: 138 lower and middle primary schools with 10,000 pupils; 4 upper primary schools with 420 pupils; 2 lower secondary schools, 184 pupils, and 6 English schools with 549 pupils. The special schools under the minister of public instruction and worship registered in 1911 a total of 278 students distributed as follows: medical college, 108; training college for teachers, 68; civil service college, 70; school of midwifery, 32.

The present king, like his father, Chulalong Kom, son of Maha Mongkut, employs a permanent staff of European and American advisers and is gradually introducing western ideas into the administrative system. The penal code was definitely formulated and carried into force Sept. 21, 1908. The metropolitan force is well organized, and internal improvements are pushed in every direction.

A. T. S.

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Lemire, Ch. *La France et le Siam.* (Paris, 1903.)
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SICARD, ROCH-AMBROISE CUCURRON (1742–1822). — French abbé and educator of the deaf and dumb, born at Fousseret (near Toulouse). After acting as principal of a school for deaf-mutes at Bordeaux (1786–1789), he succeeded Abbé de l'Epée (*q.v.*) in Paris. In 1795 he became a member of the Institute. He was the author of *Mémoire sur l'Art d'instruire les Sourds-Muets de Naissance* (*Memoir on the Art of Teaching Deaf-mutes from Birth*, 1780), and *Théorie des Signes pour l'Instruction des Sourds-muets* (*Theory of Signs for the Instruction of Deaf-mutes*, 1808–1814). Sicard was for a long time a strong supporter of the manual or sign method of teaching the deaf-mutes, but toward the end of his career he was gradually converted to the oral method. Sicard, through Thomas H. Gallaudet (*q.v.*), exercised much influence on the teaching of deaf-mutes in America.

See Deaf, Education of the.

SICKNESS IN THE SCHOOL. — See Hygiene, School; Medical Inspection.

SIDGWICK, H. — See Women, Education of.

SIDNEY UNIVERSITY. — See Australia.

SIENA, ROYAL UNIVERSITY OF. — See Italy, Education in.

SIGHT. — See Eye.

SIGHT READING. — See Reading.

SIGHT WORDS. — See Reading.

SIGHT WORK. — In teaching reading, in either a foreign language or the vernacular, exercises in translating or reading advanced work without preliminary preparation is termed *sight work*. It supplements recitation on prepared work, fostering that confidence and facility which constant recitation on prepared work does not develop.

H. S.

See Reading, Teaching Beginners.

SIGNALS. — See Management, School.

SIGNATURE. — See Musical Notation.

SIGNIFICANT FIGURES. — As soon as the Hindu-Arabic numerals (see Notation) were introduced into Europe the difference between the nature of zero and the other figures was the subject of comment by several writers. In order to explain clearly the fact that the zero has no value by itself, while the other nine *notæ* or *characteres* signify definite values, the latter were called significant figures. Stifel (1544) says of them: *Et nouem quidem priores, significatiuæ uocantur*, and other Latin writers used similar expressions The word was soon adopted in French, as in the work of Peletier (1549): *Chacune des neuf premières* (*qui sont appellèes significatiues*). . . . The Germans had a similar term, *bedeutlich*. Thus Grammateus (1518) speaks of *neun bedeutlich figuren*, and Adam Riese (1522) says *Die ersten neun sind bedeutlich*. In English, "signifying figures" was a common expression with such early writers as Recorde (1540) and Baker (1568).

At present the explanation of the numerals is not found so difficult as to make it seem worth the while to perpetuate the expression "significant figures," and it is accordingly being discarded by writers on elementary arithmetic.

D. E. S.

SIGNS. — See Deaf, Education of the.

SIGOURNEY, LYDIA HUNTLEY (1791-1865). — Writer and advocate of the higher education of women (*q.v.*); was educated in the district schools of Connecticut and by private tutors. She taught in the district schools and was principal of a private secondary school for girls at Hartford. She was active in the movement that resulted in the organization of secondary schools for girls in New England. W. S. M.

SILENT READING. — Reading in silence is an exercise specially devised (1) to focus attention upon the thought rather than the mechanics of reading, and (2) to foster a more rapid rate of reading than children ordinarily develop by the oral method. Silent reading is a supplement to oral reading throughout the grades, — (*a*) quite secondary in the primary classroom, where the formal work of translating visual symbols into sounds is difficult, (*b*) most important in the intermediate grades, where quick and accurate thought getting is the chief aim (*c*) once more subordinate in the class work of the grammar grades, where the expression or communication of literary feeling and form is stressed. H. S.

See Reading, Teaching Beginners.

SILJESTRÖM, PER ADAM (1815-1892). — Swedish educator, born at Calmar, Sweden, and educated in the elementary and secondary schools of Sweden. He engaged in elementary school work and was active in the reorganization of elementary education along modern lines. He visited England and the United States and made a careful study of the elementary school problems in these two countries. He was especially impressed with the public school revivals in Massachusetts under Horace Mann (*q.v.*) and in Connecticut under Henry Barnard (*q.v.*). His impressions of American education were embodied in a comprehensive work entitled *Educational Institutions of the United States*, which was translated from the Swedish into English by Frederica Rowan (London, 1853). Siljeström founded at Stockholm the New Elementary School, which was patterned after the newer conceptions of education, with considerable emphasis on nature study and the nascent interests of children. He was for many years director of this school and afterwards emeritus director. He died at Stockholm, Feb. 19, 1892. He was the author of a number of important books on education. W. S. M.

SILL, EDWARD ROWLAND (1841-1887). — Poet and teacher; graduated at Yale College in 1861. He taught for several years in Ohio; was principal of the Oakland (Cal.) High School from 1871 to 1874, and professor of English literature in the University of California from 1874 to 1882. The excellent courses in English in California secondary schools are largely due to his efforts. W. S. M.

SILLIMAN, BENJAMIN (1779-1864). — Scientist and author of scientific textbooks; graduated from Yale College in 1796. He was tutor and professor at Yale from 1799 to 1853. He was active in the American lyceum movement (*q.v.*) and gave many public courses of lectures on scientific subjects. He founded the *American Journal of Science* (1818) and was president of the American Association of Geologists in 1840. He traveled widely in Europe, and his *Journals of Travels* (1810) gives accounts of the scientific institutions in the Old World. He was the author of textbooks on chemistry and geology, and many scientific works. W. S. M.

SIMMONS COLLEGE, BOSTON, MASS. — Was founded in accordance with the provisions of the will of John Simmons, a Boston merchant, who died in 1870. The charter was granted in 1899 and students were received in 1902. Simmons College is a technical college for women and was the first collegiate institution of this character established in the United States. The requirements for admission are essentially the same as those of the usual academic colleges, except that no ancient language is required. The regular programs of study occupy four years and lead to the degree of B.S. These programs include not only the necessary technical or professional studies, but also the most closely related academic subjects, and furnish therefore not only the preparation for a vocation, but also the essentials of a liberal education. Briefer programs, including only technical studies, are also offered for graduates of other colleges and for especially mature students. The technical departments of the college are the following: (1) household economics, (2) secretarial studies, (3) library science, (4) general science, (5) social work, (6) industrial teaching. The college possesses several dormitories in addition to its instruction buildings. Its endowment is about two million dollars. In 1912 there were 97 instructors and 944 students in the regular classes, and about 200 students in the extension and summer classes. Of the regular students 99 were graduates of other colleges. H. L.

SIMON, JULES FRANÇOIS (1814-1896). — French statesman, philosopher, historian, teacher, and journalist. He entered the Ecole Normale in 1833, and left there three years later with the title *Agrégé* (*q.v.*). During that time he met Victor Cousin (*q.v.*) and began a long friendship. He taught philosophy in the lycées at Rennes, Caen, and Versailles.

and received an appointment at the Sorbonne in 1839. He also taught at the École Normale, his work both here and at the university meeting with notable approbation. Elected to the National Assembly (1848) he was appointed to the Conseil d'État, whence he was retired and likewise removed from his professorship by his refusal to submit to Louis Napoleon after the *coup d'état* of 1851. He was returned to the Assembly in 1863, and subsequently played an important rôle in the troublous activities of the war and the post-war period. He was Minister of Public Instruction (1870–1873), and Prime Minister (1876–1877). In 1875 he was elected to the French Academy. A stout champion of educational privileges for all, he strove to dot the country with schools which should be not only free but compulsory. He was unable to carry through these fundamental changes in educational policy on account of the precarious state of the national finances after the war. It was about ten years later before they became a reality, but in the meantime he had struggled for the reorganization of the whole educational system in response to the oft-quoted assertion that it was the Prussian school teacher who was responsible for France's downfall. He was the author of more than thirty books and of enough scattered articles to make one hundred more. Among his more important writings may be mentioned the following: *L'École* (Paris, 1864); *Histoire de l'École d'Alexandrie* (2 vols., 1844–1848); *Instruction gratuite? laïque? obligatoire?* (Paris, 1872); *La Liberté de Conscience* (1857); *La Réforme de l'Enseignement secondaire* (1874).

F. E. F.

See France, Education in.

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Simon, Jules. *Premiers Mémoires* (1900); and *Le Soir de ma Journée* (1902), both edited by his son Gustave Simon.

SIMPLIFIED SPELLING BOARD. — See Spelling and Spelling Reform.

SIMULATION. — Abnormalities are simulated for various purposes (to arouse pity, to make money, or to escape the consequences of certain acts). The simulation of insanity is common among criminals, but it is now recognized that many of the individuals who simulate insanity are cases of hysteria or of real insanity, and that the simulation is secondary to the true mental disorder.

Among children simulation of injuries to escape the performance of unpleasant tasks is common. Care must be exercised in the differentiation of the real from the imaginary, and the possibility of the condition being due to vivid imagination must be kept in mind. S. I. F.

SIMULTANEOUS METHOD. — See Christian Brothers' School; La Salle.

SIMULTANEOUS SCHOOL (SIMULTANSCHULE). — The term used most generally in Germany to refer to the type of elementary schools attended by children of different religious denominations, each of which gives its own religious instruction through either teachers, where the numbers justify the engagement of teachers of other than the official church, or visiting clergy of the respective denominations. Frequently this type of school is also called *paritätisch.* In these cases, religious instruction does not form the core of the curriculum as it does in the denominational schools (*Konfessionsschulen*), but has its place alongside of the other subjects of instruction. The term simultaneous schools is also employed to include other types of schools which are not denominational, *e.g.* (1) schools in which no religious instruction is given or where moral instruction takes its place. This form is not found in Germany. (2) Interdenominational schools, in which children of all denominations are given instruction in the common fundamentals of all religions. Such schools have been established in Nassau. In the German secondary schools the principle of simultaneity of the type above mentioned, by which ministers of the different denominations have the right of entry, seems to have been generally accepted.

See Germany, Education in.

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SINGING, HYGIENE OF. — See Music; Speech Defects; Voice.

SINGING IN THE SCHOOLS. — See Music in School.

SINGING SCHOOLS. — See Gregory the Great; Middle Ages, Education in, section on Song Schools.

SINTHEIM, SINTHEN, or ZINTHIUS, JOHN (fl. 1476). — A teacher at the St. Lebuin School at Deventer of which Alexander Hegius (*q.v.*) was the headmaster. Sintheim belonged to the Brethren of the Common Life (*q.v.*). He appears to have had a reputation throughout Northern Europe as a humanist scholar, and Erasmus (*q.v.*) after decrying the school generally says, "From Hegius and Sintheim the school drew some savour of true letters." Sintheim, on his side, showed much admiration for Erasmus' ability. He edited the *Doctrinale* of Alexander de Villa Dei (*q.v.*), and published grammatical commentaries.

SISTERS OF CHARITY, GRAY NUNS. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF CHARITY OF ST. VINCENT DE PAUL. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF CHRISTIAN CHARITY. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF MERCY. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF NOTRE DAME. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF NOTRE DAME DE NAMUR. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF PROVIDENCE. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF ST. JOSEPH. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF THE BLESSED SACRAMENT. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF THE GOOD SHEPHERD. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF THE HOLY CROSS. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SISTERS OF THE HOLY NAME OF JESUS AND MARY. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SIZE OF SCHOOL CLASSES, EXCESSIVE. — See SCHOOL MANAGEMENT.

SKEPTICISM. — See DOUBT.

SKIN DISEASES. — See INFECTIOUS DISEASES.

SLANG. — See ENGLISH USAGE.

SLATE. — **Early History.** — The ancient precursors of the slate were the wax tablets, used by Greeks and Romans, and a black tablet used by the Hindus. The ordinary method was to write upon the wax with a stylus, although Herodotus speaks of a letter being written on wood, which was then covered with wax before being sent. The common form was a pair of tablets inclosed in wooden frames and hinged together by wires. The resemblance of these ancient wax tablets to the slates so recently used in our schools is too striking to be wholly accidental. Albīrūnī (1000 A.D.) in his work describing the customs of the people of India, states that the Hindus at that time used black tablets for the children in the schools, writing upon them from left to right with a white material. Prosdocimo de Beldamandi, in a work on arithmetic of 1410 (printed in 1483), gives one of the earliest references to the modern slate, stating that the calculator has always a stone tablet upon which he is able to write and erase the figures used in his calculation. Chaucer makes probably the first mention of the slate in English literature in his *Astrolabe* II, § 44: "enter hit in-to thy slate."

In American Schools. — Slates were rather slowly introduced into our schools and were rarely found before the close of the Revolutionary War. But there is in the possession of the American Antiquarian Society at Worcester, Mass., an inlaid slate, set in the top of a desk, which was a gift from Rev. Nehemiah Walter, a Harvard graduate of 1684, to his daughter. A letter from a New England schoolboy to his father in 1752, in which he requests his mother to send him among sundry other things his "slate and som pensals," is extant. In Mr. Wm. B. Fowle's report to the trustees of the Boston Monitorial School in 1825, he says, "Every child in school is furnished with a slate and pencil, which are considered a part of the furniture of the school." (See *Journal of Education*, Vol. I, p. 33).

School slates have disappeared from nearly all the schools in this country except remote rural regions. While they served a good purpose in their day, they were dirty, noisy, and hard on the eyes of the children as well as foreign to the procedure of ordinary business. Paper and pencils have taken their place, to the advantage of the pupil, the teacher, and public health generally. L. C. K.

SLATER, J. F., FUND. — One of the great educational foundations of the United States established for the education of freedmen. In 1882 John F. Slater, a cotton and woolen goods manufacturer of Connecticut and Rhode Island, granted $1,000,000 in trust "for the uplifting of the lately emancipated population of the Southern States and their posterity by conferring on them the blessings of Christian education." Through good management the fund has not been reduced. There are nine trustees in charge of the fund with W. A. Slater as president, and James H. Dillard as general agent. As with the Peabody Fund (*q.v.*) the founder allowed considerable latitude in the disposal of the money. The Fund has, however, been up to the present mainly devoted to the support of normal and industrial education. Aid was given in the early days to such institutions as give "instruction in trades and other manual occupations" for the purchase of machinery and apparatus.

At present, grants varying from $100 to $10,000 are made to institutions for the payment of salaries to teachers of industrial subjects, principals and directors, and for supplies and running expenses of institutions for the education of the colored race. From 1908 an annual grant of $1000 for three years was made to Charleston, S.C., to maintain an industrial school for the negroes as part of the public school system. In this way a precedent was established for assisting public authorities in extending their system in a way which might otherwise have been impossible.

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SLAVONIA. — See CROATIA.

SLEEP. — The state of sleep is of importance to the psychologist because there appears in this state so radical a modification of the nervous and mental condition that the explanation of normal waking life is largely influenced by a consideration of the suspension of normal activity in sleep. Studies of the nervous system indicate that the internal resistance of the nervous tissues is increased during certain portions of the day. During these periods the nervous system is undoubtedly engaged in more energetic building up of its tissues. The suspension of activity seems to come in rhythmical waves, and is not necessarily connected either with fatigue or exhaustion. Thus, an individual who has been in the habit of closing his day's work at a given period will always feel drowsy and sleepy at that time, whether he has worked energetically during the day or not. In young children the rhythm seems to be somewhat shorter in its periods than with mature individuals. A close relation between this fact and the shorter period of the child's attention undoubtedly exists. The nervous conditions which arise during sleep do not appear in all parts of the nervous system in the same degree. Thus, in ordinary sleep the higher centers of the cerebrum are more completely suspended in their activities than the lower centers of the spinal cord. Indeed, the lower centers may be said to continue their activity without serious interruption. The reflex processes of the abdomen, and the reflex control of the limbs go on during sleep without interruption. In some cases excitation takes place in the higher centers, and there results a more or less complete establishment of ideational processes. (See DREAMS.)

Various abnormalities of sleep arise, such as somnambulism (*q.v.*) and trance (*q.v.*). Artificial sleep may be produced by the use of various drugs and in hypnosis (*q.v.*). C. H. J.

See INSOMNIA.

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BALDWIN, J. M. *Dictionary of Philosophy and Psychology*, Vol. III, pt. ii, pp. 1034–1040.

SLOYD. — See MANUAL TRAINING.

SMALL POX. — See CONTAGIOUS DISEASES.

SMART, JAMES HENRY (1841–1900). — University president; was educated in the public schools of New Hampshire. He was principal of rural and graded schools in New Hampshire (1859–1863); principal of schools at Toledo (1863–1865); superintendent of schools at Fort Wayne, Ind. (1865–1874); state superintendent of public instruction of Indiana (1874–1878), and president of Purdue University (1883–1900). He was one of the educational commissioners to the Paris Exposition of 1878. His publications include *Institute System of the United States*, *Ideal School System for a State*, and various papers on educational subjects. W. S. M.

SMELL. — See SENSES.

SMITH, ADAM (1723–1790). — The economist and philosopher, born at Kirkcaldy and educated at home, at Glasgow University and at Balliol College, Oxford. After giving free public lectures at Edinburgh, he was appointed professor of logic at Glasgow in 1751 and professor of moral philosophy in 1752. From 1766 he traveled in Europe for a few years and came into intimate contact with the encyclopedists and physiocrats of France, who exercised a strong influence over him. In 1778 he received an appointment as Commissioner of Customs and spent the rest of his days in Edinburgh. In 1787 he was elected Lord Rector of Glasgow University. He was the author of a number of philosophical works; but he is best known by his *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776). In Bk. I, Ch. 1, Articles 2 and 3 of this work, Smith deals briefly with education under the titles "Of the Expense of the Institutions for the Education of Youth," and "Of the Expense of the Institutions for the Instruction of People of all Ages." Except for an interesting application of the rule of *laissez-faire* to education and an attack on endowments (*q.v.*), there is nothing of permanent value in this chapter. Competition, emulation, and rivalry act as stimuli for the teacher; endowments cripple his application. Smith attacks the universities and schools not only for neglecting their work in the financial security enjoyed by them, but for the narrow scope of such work as they offer. "The greater part of what is taught in schools and universities, however, does not seem to be the most proper preparation for that business" (of the world). In the case of women, for whose education public institutions did not generally exist, there was no waste, for their parents gave them just that instruction which was of use to them. Dividing the population into the common people and the middle and upper classes, Smith holds that the latter by force of circumstances will educate themselves; it is the common people, engaged in occupations which have a deadening effect on their intelligence, who require attention. Reading, writing, and accounts, with geometry and mechanics are the minimum instruction to be required of all. "For a very small expense the public can facilitate, can encourage, and can even impose upon almost the whole body of the people, the necessity of acquiring these most essential parts of education. . . ." Smith advocates the establishment of parish or district schools, maintained partly at public expense, partly by fees. But attendance is only indirectly to be made compulsory — by instituting an examination for entrance to a trade or profession or to obtain the freedom of a corporation. Finally, Smith emphasizes the value of education to man as a human being as well as its social value to a nation. "A man without the proper use of the intellectual faculties of a man is, if possible, more contemptible than even a coward, and seems to be mutilated and deformed in a still more essential part of the character of human nature. Though the state was to derive no advantage from the instruction of the inferior ranks of people, it would still deserve its attention that they should not be altogether uninstructed. The state, however, derives no inconsiderable advantage from their instruction. The more they are instructed, the less liable they are to the delusions of enthusiasm and superstition, which, among ignorant nations, frequently occasion the most dreadful disorders."

In the second article Smith deals mainly with institutions for religious instruction and strongly advocates the study of science and philosophy (encouraged by compulsory entrance examinations to the professions) as a means by which "the state might, without violence, correct whatever was unsocial or disagreeably rigorous in the morals of all the little sects into which the country was divided."

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Dictionary of National Biography.
RAE, J. *Life of Adam Smith.* (London, 1895.)

SMITH, ANSON (1811–1887). — Superintendent of schools; educated at Williams College. He was superintendent of the schools of Toledo (1850–1856); state superintendent of the schools of Ohio (1857–1863); and superintendent of the schools of Cleveland (1863–1867). W. S. M.

SMITH, ASA DODGE (1804–1877). — Graduated from Dartmouth College in 1830 and studied at the Andover Theological Seminary. He was principal of an academy at Limerick, Me., and was president of Dartmouth College from 1863 to 1877. He was the author of *Moral Element in Education.*

W. S. M.

SMITH, CHARLES SPRAGUE (1853–1910). — College professor and social worker, born at Andover, Mass., and educated at Amherst College where he graduated in 1874. From 1875 to 1880 he traveled in Europe; on his return he became professor of German at Columbia University and in 1892 professor of modern languages and foreign literature. Owing to failing health, he resigned his professorship in 1891 and was for a time a public lecturer. In 1895 he organized and became President of the Comparative Literature Society. His best known work, however, was the establishment of the People's Institute (*q.v.*) in 1897, with which he was connected until his death. In 1907 he founded the Ethical Society League to promote the coöperation of the church and civil bodies in public matters. Professor Smith was the author of *Barbizon Days* (1902); *Working with the People* (1904); and a volume of *Poems*, published in 1908.

SMITH COLLEGE, NORTHAMPTON, MASS. — Founded by Miss Sophia Smith, who bequeathed about $350,000 for that purpose, named a board of trustees, and stated as the object of the college: "The establishment and maintenance of an institution for the higher education of young women, with the design to furnish them means and facilities for education equal to those which are afforded in our colleges for young men." The college was incorporated and chartered in March, 1871, and in that same month the citizens of Northampton voted the small sum of $25,000 which decided its location in that town. In June, 1873, Rev. L. Clark Seelye, professor of English literature at Amherst College, was chosen president, but the opening of the college was postponed until 1875. At the beginning of the fourth year, 1878, when for the first time four regular classes were in attendance, there were 133 students, 72 of whom were in the entering class, and the resident faculty had increased to fourteen. In September, 1911, the number of students was 1509, and that of the faculty 120. At the first commencement in 1879 degrees were conferred on eleven graduates; in 1911 the graduating class numbered 357, and the alumnæ 4900.

The endowment, which at the start was so small that the trustees allowed it to accumulate for four years before opening the college, has always remained inadequate for its growing needs. Gifts have added to it, but the total of these is not large as compared with the amounts received by many colleges with fewer students. That, in spite of this fact, the college has been able to provide the necessary equipment and excellent instruction for so many students is a tribute to the administrative ability of its first president. The academic buildings now (1912) number thirteen, and there are fifteen large houses for student residence.

At the time that Smith College was opened, the higher education of women was still in the experimental stage. Among the institutions which provided for their instruction, Vassar College was the only one which could be properly called a college, and it had a large preparatory department. Hence the general principles which the trustees of Smith College adopted are worthy of note: There was to be no preparatory department; the courses of study and the grades of scholarship were to be those required for the degree of bachelor of arts in the best colleges for men; at the same time, the college was to be distinctively a college for women, with every possible opportunity for developing and perfecting womanly characteristics.

The curriculum from the first corresponded with the prevailing usage in New England colleges, but offered a wider range of electives than most of these, and among them music and art were included as academic subjects. In accordance with a provision of Miss Smith's will, the Bible found a place in the curriculum, but as a literary rather than as a theological study. Emphasis has always been placed on physical culture, — systematic exercise being required of all students throughout their course, — in the first two years by class work in the gymnasium. Sports, especially out-of-door sports, are encouraged, but no intercollegiate contests have ever been permitted.

Another departure from precedent was the plan of housing the students in comparatively small groups in separate houses, each of which is presided over by a woman who has charge of the social and domestic life, and each house is conducted so far as possible as an independent and well-ordered private home.

The first president of Smith College, Rev. L. Seeley, D.D., LL.D., to whose wisdom and tireless effort is chiefly due the great success of the adventure which thirty-seven years ago seemed so uncertain, resigned his office in 1910, and was succeeded by Marion Le Roy Burton, PH.D., LL.D. J. T. S.

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Celebration of the Quarter Century of Smith College. (Cambridge, Mass., 1900.)

SMITH, GOLDWIN (1823–1910). — An educator, writer, and critic born at Reading, England, the son of a practicing physician. Educated at Eton and Oxford, he was graduated from the latter in 1845 with first-class honors in classics, having also taken the Hertford and Ireland prizes and scholarships for English prose and for Latin prose and verse. He was called to the English bar in 1847, but finding the life of a barrister too narrow he soon turned to literary and educational work. He was one of the early contributors to the *Saturday Review.* His first conspicuous work, however, was as assistant secretary to the Royal Commission investigating Oxford University and as secretary to the second Commission (1852). His *Report* was an influential instrument in freeing Oxford from many abuses, and to Smith was given the credit and the criticism as well. In the same year appeared his *Lectures on the Study of History.* In 1858 he became Regius Professor of Modern History at Oxford, which position he held until 1866. During this period he took an active part in the reform movements in England and in the antislavery discussion in America. In 1868, partly because of dissatisfaction with tendencies in English life, partly because of interest in American political affairs, he became professor of English and Constitutional History in Cornell University, just then opening its doors. He remained in active service only three years, but continued to hold an honorary professorship. In 1873 he moved to Toronto, Canada, where he continued to reside until his death.

This long period was devoted to active intellectual pursuits not only as a writer, but as a journalist and lecturer. One great ideal which he advocated was the political union of Canada and the United States. Through his independence of thought and action he exerted a most stimulating influence on opinion in the United States as well as in Canada. An outspoken critic, he risked much of his popularity in later life by criticizing the Boer War and the American expansion following the Spanish War.

Beginning active life as an educational reformer, he left his mark on education as well as on politics in the countries with which he was connected. His writings were most numerous. Perhaps the most notable are those on *The Political Destiny of Canada* and *Canada and the Canadian Question.* Others are: *Political History of the United Kingdom, Political History of the United States,* and *Essays on Questions of the Day, Irish History and Irish Character, Three English Statesmen, The Empire, Does the Bible Sanction Amercan Slavery? The Civil War in America, Letter on Southern Independence, Rational Religion and Rationalistic Objection, The Political Destiny of Canada, Loyalty, Aristocracy and Jingoism, False Hopes, Lectures and Essays, Cowper, Jane Austen, The United States, Essays on Questions of the Day, A Trip to England, Oxford and her Colleges, William*

Lloyd Garrison, Bay Leaves, Specimens of Greek Tragedy, Guesses at the Riddle of Existence, The United Kingdom, Commonwealth or Empire, In the Court of History, The Founder of Christendom, Lines of Religious Inquiry, My Memory of Gladstone, Irish History and the Irish Question, In Quest of Light, Revolution or Progress, Labor and Capital, and *No Refuge but the Truth.*

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Smith, Goldwin. *Reminiscences*, edited by Arnold Haultain. (New York, 1910.)

SMITH, JOHN BLAIR (1756-1799). — First president of Union College; graduated from Princeton in 1773. He was instructor at Hampden-Sidney College from 1777 to 1779 and president of the college from 1779 to 1789. He was president of Union College from 1795 to his death. W. S. M.

SMITH, SAMUEL STANHOPE (1750-1819). — First president of Hampden-Sidney College; graduated at Princeton in 1769. He was tutor at Princeton and later taught in a school conducted by his father. He was president of Hampden-Sidney College (1775-1779); professor at Princeton (1779-1795), and president of Princeton (1795-1812). Author of *Lectures on Moral and Political Philosophy*, and several works on religion. W. S. M.

SMITH, SIR THOMAS (1513-1577). — English scholar and statesman, born at Saffron Walden, Essex. After preparation, probably at the grammar school of his native town, he entered Queens' College, Cambridge, in 1526, and was made King's scholar in 1527. On graduating B.A. he was appointed fellow in 1529-1530 and proceeded to his M.A. in 1533. In the latter year he became public reader and lectured on natural philosophy in the schools and Greek in his own rooms. Four years later he was appointed Public Orator. From 1540 to 1542 he visited the universities of France and Italy, and graduated in law at Padua. On his return to Cambridge he became prominent in the proposals for the reform of the pronunciation of Greek and with Cheke (*q.v.*) strongly advocated a restoration in pronunciation of the proper values of the vowels and diphthongs, as had been proposed earlier by Erasmus, in opposition to the prevailing practice of giving them all the same value as *iota*. The reformers were known as "etists"; their opponents as "itists." Some progress was made by the reformers, when in 1542 Gardiner issued a decree ordering a return to the old practice. This called forth a pamphlet from Smith in defense of the reform *De recta et emendata linguæ Graecæ pronunciatione* to which was added another on a reform of the English alphabet by the addition of five vowels (*De recta et emendata linguæ Anglicanæ Scriptione*). In 1543-1544 Smith was appointed Regius Professor of Civil Law and by the methods which he had studied abroad contributed to a revival of interest in the subject. In the same year he served also as vice-chancellor of the university and introduced formal matriculation and registration of all students. From 1547 to 1554 he was provost of Eton. The last thirty years of his life, with the exception of his retirement during Mary's reign, he spent in active public life as a diplomatist and member of Parliament, but continued to maintain his interest in his *Alma Mater*. Smith had the reputation of being one of the most versatile scholars of his age and as a classicist was a strong rival of Cheke.

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SMITH, WILLIAM (1727-1803). — First president of the University of Pennsylvania; graduated from the University of Aberdeen in 1747. He was Commissioner of Schoolmasters in Scotland, and later came to America as a private tutor. He was the first provost of the College and Academy of Philadelphia (1754-1779). When the charter of the institution was revoked, he became chief director of the German schools of the Province of Pennsylvania. He was president of Washington College from 1782 to 1789; and with the restoration of the charter of the University of Pennsylvania (1789) he again became president of that institution. He was the author of a number of historical and religious works. W. S. M.

See Pennsylvania, University of.

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Wickersham, James Pyle. *History of Education in Pennsylvania.* (Lancaster, 1886.)

SMITHSONIAN INSTITUTION, WASHINGTON, D.C. — An institution established in 1846 by Act of Congress in accordance with a bequest of James Smithson (1765-1829), who left $515,169 to the United States "for the increase and diffusion of knowledge among men." Smithson, Lewis, or Macie, as he was variously known, was the illegitimate son of the Duke of Northumberland. He was interested in scientific study, especially chemistry and mineralogy, and was elected a member of the Royal Society. The Smithsonian Institution was placed under a board of regents consisting of the Vice President, and Chief Justice of the United States, three regents appointed by the president of the Senate, three by the speaker of the House of Representatives, and six selected by Congress, of whom two were to be from the District of Columbia and the rest from four different states. Joseph Henry was appointed secretary. The chief purpose of the Institution is to encourage research and publish reports and treatises. A library and various collections were formed. The earliest investigation conducted was a study of the phenomena of storms, and this work led later to the establishment of the Weather Bureau. The various exploring expeditions added considerably to the collections of the Institution. Among the publications of the Smithsonian are *Contributions to Knowledge*, begun in 1848; *Annual Report of the Board of Regents*, since 1847; *Smithsonian Miscellaneous Collections*, since 1860. Connected with the Institution are the following departments for the study of special branches: Bureau of Ethnology, organized in 1879; the National Zoölogical Park, 1890; Astrophysical Observatory, 1891. In 1891 a bequest was left by Thomas G. Hodgkins and part of this was used to encourage studies in the nature and properties of atmospheric phenomena. Since 1900 the Institution contributes scientific literature in America to the International Catalogue. The American Historical Association and the National Society of the Daughters of the American Revolution submit reports to Congress through the Institution.

See Museums, Educational.

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SNELL, GEORGE. — Friend of Samuel Hartlib and John Dury (*qq.v.*). In 1649 Snell wrote under the anagram of "In Grege Solus," a treatise on *The Right Teaching of Useful Knowledge.* Snell had been asked by Hartlib and Dury to write out a scheme of study whereby youths "may henceforth be realists and materialists; to know the very things and matters themselves." Snell insists on the "vocal and manual institution of children." By "vocal" teaching he means clear pronunciation; by "manual" instruction he would have children, "as it were hand-led *to do and act every duty.*" Snell appeals for a comprehensive dictionary for the English language, and at the same time he proposes an "edict" to settle what the words are of the English language. He advocates the school teaching of shorthand for the speedy taking down of lectures and sermons. Every one above an artificer should learn arithmetic. His lectures on the teaching of good manners and civility have much good sense. One of his suggestions — common to him and Milton — is the teaching of the laws of England. Before leaving school, the pupil is to be instructed as to the best books to acquire to help him to perform fully the duties of his future life. Young children should be taught not to be terrified by tales of witchcraft, devils, etc., and elder ones should be put on guard against cheaters and deceivers. Snell gives excellent reasons for the study of Latin. He thinks by good methods of teaching Latin, time may be saved for mathematics, cosmography, drawing. Snell is encyclopedic almost as far as Milton, and his proposals in 1649 suggest the organization of secondary education. F. W.

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SOCCER FOOTBALL. — This game, like Rugby football, had its origin in the ancient game of football which has been traced back to the Greeks and Romans. When the students in the English public schools began to plan organized football in the early part of the nineteenth century, two sets of rules were adopted with the result that after a few years two distinct games of football had been developed. One was Rugby (see Football) and the other Soccer, also known as Association football. Soccer grew rapidly in favor all over Great Britain and the British colonies. To-day it occupies in Great Britain a position similar to that of baseball in the United States. There are professional teams organized into leagues; and the popular interest in the big matches is such that more than one hundred thousand people attend a single match. There are thousands of organized teams in the schools, universities, towns, and cities of Great Britain and the British colonies. Soccer has been introduced in continental Europe, China, Japan, and other countries, and bids fair to become the most popular and widespread athletic game in the world.

In the United States, soccer was introduced by Englishmen about 1880. The first teams were organized among workers in the mill towns of New England. About 1903 the game was introduced in a few schools and colleges. Since that time the interest in soccer has increased by leaps and bounds. There are now thousands of organized teams in the colleges, secondary and elementary schools. It is estimated that during the present school year, 1912-1913, soccer is played by more students than American football.

Some prominent educators advocate the substitution of soccer for American football in elementary and secondary schools. Many schools have already made the change with entirely satisfactory results. Soccer has been introduced in several girls' schools. Under proper supervision, there is no reason why healthy girls should not play this game and derive much wholesome recreation and physical benefit. The remarkable growth of interest in soccer is due to the inherent qualities of the game. It may be played by students of all sizes and ages, from the elementary school to the university. The game is simple enough for novices to enjoy it from the beginning, and yet it affords opportunities for increasing skill. The equipment required for the players is simple and inexpensive. The regulation costume consists of a flannel shirt, flannel flappers, stockings, and stout shoes, but boys usually play the game in ordinary street clothing.

As an exercise for growing boys and young men, soccer is very beneficial. The object is to advance a round football by kicking and dribbling until near enough to the opponent's goal to kick the ball between the goal posts. The players are constantly running and dodging, thus getting a large amount of wholesome natural exercise.

Soccer affords all the educational values of the best team games. It is played by teams of eleven players, and team play or coöperative effort is essential to success. The players (except the goal keeper) are not permitted to touch the ball with the hands; and personal contact between players, such as tackling and holding, is prohibited. This is the chief difference between soccer and American football, and because of this characteristic soccer players rarely suffer serious injuries.

G. L. M.

See Athletics, Educational.

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SOCIAL ACTIVITIES. — See School as a Social Center; Student Life.

SOCIAL CENTERS, SCHOOLS AS. — See School as a Social Center.

SOCIAL CONSCIOUSNESS. — See Imitation; Self; Social Psychology.

SOCIAL EDUCATION — See Moral Education; also Citizenship and Education; Sociology and Education.

SOCIAL HEREDITY. — See Imitation; Tradition.

SOCIAL PSYCHOLOGY. — That division of the science of psychology dealing with the mental processes which grow out of the social relations of conscious individuals. Many of the characteristics of the individual are dependent upon his social environment. There is therefore no sharp line of distinction between the subject matter of general psychology and the subject matter of social psychology. On the other hand, it is convenient for purposes of discussion to distinguish between the mental processes of the individual and those phases of life which are dependent upon social intercourse. Thus language is primarily a product of the community as a whole. Individuals use language and are very largely determined in their modes of thought by the language which they employ. On the other hand, no individual is able to produce a language without the coöperation of others. Indeed, as was pointed out in the study of language (*q.v.*) one of the most important conditions for the selection of verbal reactions is the presence of an answering social companion. Language, therefore, may be regarded as a special topic under social psychology.

The term social psychology as thus employed is broader than any of the special terms which deal with social activities. Thus, race psychology (*q.v.*) deals with the peculiar characteristics of different races. Mob psychology (*q.v.*) deals with the characteristics of a peculiar social group. Folk psychology has been suggested as the more general term, but in ordinary usage the term "folk psychology" is virtually a synonym of the term "race psychology."

The general term social psychology is here used as the translation of the German word *Volkpsychologie* or *Völkerpsychologie*. The most elaborate work on this subject is from the pen of Wilhelm Wundt. He divides the field into three main divisions: (1) Language, (2) Myths and Religion, (3) Customs and Laws. He calls attention in the introduction to this work to the justification for the use of the term "social consciousness." There are certain conscious processes, which, as indicated above, would never be possible outside of the social group. Thus a custom could not develop except as there were various persons who imitated each other, and thus perpetuated the custom. (See Imitation.)

In recent psychological discussions, increasing emphasis is laid upon the social environment and the mental characteristics which are induced through contact with this social environment. Thus the presence of a word in the common language of the social group is enough to direct the attention of the individual to facts which would otherwise escape his notice. The mere naming of an object is therefore a means of controlling the individual through his social environment. The exercise of all forms of authority over the individual represents another type of social control. The child grows up in the presence of his elders, and is from the outset dominated by their interests and their habits. He readily takes on those modes of action which are congenial to the group as a whole.

The individual may sooner or later break away from those modes of behavior that belong to the group. He then manifests individualistic traits as distinguished from the social traits which he takes on as a member of the community. Individualistic traits of an important order appear in such personalities as those described by the term genius (*q.v.*). In such cases, because of unusual personal endowments, the individual is able to direct his own conduct in novel ways. Very frequently the advantage of the social group is served by the later imitation of the activities of the genius. In some cases, however, the eccentricities of the genius have no social importance and are never imitated by others.

For the purpose of education, it is important to distinguish between certain individual characteristics and characteristics of the social type. Thus, manual dexterity is in a very large measure an individual possession. It may indeed grow out of imitation of others, and may thus be the product of social relations, but in so far as manual dexterity depends upon individual practice rather than upon imitation, it is an individual possession, and it is not easily communicated to another. Reading, writing, and the system of number ideas taught in the schools are, on the other hand, primarily social activities undertaken not on individual initiative or for the purpose of increasing the skill of the individual, but for the purpose of putting him in contact with his fellows. Language has, therefore, a peculiarly social significance in the education of the individual. This is still more obvious when we consider the importance of the number system as it is taught to children. The number system is an elaborate method of thought which has been worked out by the race, and is given to the individual, very frequently without any elaborate explanation of the use to which the individual is to put the system. Society as a whole recognizes the importance of the number system, and requires that every individual shall become acquainted with it to a greater or less extent. The extent to which the individual is required to cultivate this system of experience is often wholly unrelated to his individual needs. The system is primarily a social system.

A large part of social consciousness is dependent upon imitation (*q.v.*), often imitation of the involuntary type, rather than clear knowledge. For this reason, recent writers (see Ross's *Social Psychology*) have emphasized the importance of suggestion in all social relations. The individual takes on the habits and customs of his environment gradually and without explicit recognition of the fact that he is adopting the modes of behavior which are about him.

Another type of contrast between social consciousness and clear intellectual recognition of social relations is pointed out by McDougall in his *Social Psychology.* McDougall contends that the psychological treatises have never been available for the science of sociology because the psychologists have dwelt at great length upon the clear cognitive processes, but have given relatively little attention to the emotional processes. The emotional processes are those which lead most directly to activity, and consequently are of greatest importance in determining the relation of one individual to another. McDougall has accordingly prepared a psychology which he regards as available as the basis of sociology, and in this psychology he describes the emotional processes to the exclusion of the intellectual processes.

Both of the writers referred to in the last two paragraphs neglect, in their effort to emphasize the nonintellectual phase of mental life as the basis of social consciousness, the importance of the social arts, especially language, and they certainly underrate the conscious effort of the race to educate the younger generation in the ideas and practices of the older generation. Thus the school itself is an institution which definitely aims to carry over all of the experiences of earlier generations to the younger generations. It is not primarily an institution that does its work through suggestion, or through mere imitation. The effort of the school is to cultivate certain systems of ideas and to give these ideas definite content.

Social psychology, as a separate branch of science, is in its infancy. It is closely related to the science of sociology, which is also a relatively new science. The methods of research which are offered to social psychology are descriptive and statistical. There is a natural tendency to turn to primitive peoples for a large body of the material that is to be used in social psychology. Primitive peoples are so sharply contrasted with civilized peoples that a study of their simpler life suggests many important lessons for the student of modern life. One very suggestive contribution to this discussion has been made by Dewey. He calls attention to the fact that there is a temptation in the study of primitive peoples to describe their characteristics in negative terms. They do not have as fully developed a language as civilized peoples have; they do not have science; and they do not have many of the highly developed arts. This negative description is, however, misleading if it is assumed that the primitive race does not have many compensating positive characteristics. The hunting consciousness, for example, is full of characteristic elements and modes of operation. The hunter has his attention drawn to animal life in all of its different forms, and his social and religious ceremonial will be colored by his interest in animals. Our treatment therefore of primitive people should be not merely for the purpose of contrasting them negatively with later civilized peoples, but also for the purpose of discovering those characteristics which enter positively into their primitive consciousness. (See PRIMITIVE PEOPLES, EDUCATION AMONG.)

In the same general way it should be pointed out that children are not merely negative in their social characteristics. The child has a relatively meager vocabulary and little mastery of any of the social arts, and yet he lives in a social environment which has many positive characteristics; his social recognitions may be limited, but they are very intense. The child is more a member of the family than is the adult who comes in contact with others outside of the family group. The child is more dominated by the customs of his elders than his elders are dominated by each other. There comes a period in every child's training when there is a strong tendency to break away from the narrow restrictions of the earlier social group in which he grows up. The period of adolescence (*q.v.*), which has often been recognized as a period of great importance in education, undoubtedly gets some of its importance from the readjustment of social relations and the consequent radical readjustment of the children's attitude towards society and its controls.

The individual teacher is very frequently disposed to regard the problem of the classroom as a problem of individual psychology. The fact is that many of the problems of instruction are distinctly problems of social psychology. The class group exhibits certain characteristics that never would be exhibited by its individual members isolated from the group. There are advantages to be derived from class grouping. Thus children imitate each other more easily than they imitate adults. A group made up of children of a given age differs from a group made up of children of miscellaneous ages. Problems of class instruction as distinguished from individual instruction are, therefore, problems in social psychology as well as in educational psychology. Attention is already drawn under the term "mob psychology" (*q.v.*) to certain of the associational characteristics of the group of people who come together accidentally under high emotional tension. This type of emotional consciousness should be contrasted with the type of deliberate social consciousness which grows up in the classroom when a teacher sets a goal clearly defined to be attained through social coöperation or competition. Thus the students are called upon to be regular in attendance in order that the record of a given class may be superior to that of other classes in the school. This is not primarily an emotional situation. It is adherence under social pressure to a clearly defined ideal. C. H. J.

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SOCIAL PURITY MOVEMENT. — See SEX HYGIENE, INSTRUCTION IN.

SOCIAL REALISM. — A term recently coined to indicate a phase of educational realism (*q.v.*) of the early modern period to be distinguished from the realism of the school, which was interested either in the content of literature (Verbal Realism), or the phenomena of nature (Sense Realism). Social realism represented the combination of the literary elements of education, confined in the Middle Ages to the clergy and in the early Renaissance period to a class of scholars, with the remnants of the old chivalric education (*q.v.*), for all of the members of the upper social class. The content and literature of Social Realism are discussed under the caption GENTRY AND NOBLES, EDUCATION OF.

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SOCIAL SCIENCES. — The sciences which have for their subject matter social phenomena, that is, the phenomena occasioned by the existence of social groups, such as families, tribes, states, and nations. They are special and general. Among the special social sciences are history, political economy, politics, ethics, jurisprudence, archæology, ethnology, ethnography, demography, and technology. The general social science is sociology. It inquires into the nature of the fundamental laws and general principles underlying social phenomena, and, accepting as data the principles induced by the other social sciences, it attempts to synthesize them into a consistent whole. It bears about the same relation to the special social sciences as biology bears to the special sciences of organic nature.

With the exception of history and politics the social sciences are of comparatively recent origin. Political economy (see ECONOMICS), for instance, one of the oldest of them, although its beginning appears in scattered documents and treatises produced in many lands and at different times, was not organized into a systematized body of knowledge suitable for school instruction until the publication of Adam Smith's *Wealth of Nations* in 1776. The very name of sociology was unknown until the appearance of the fourth volume of Comte's *Philosophie Positive* in 1839.

The introduction of the social sciences in the organized curricula of the schools of Europe and America has been very slow until within the last few years. For a long time history and political economy stood almost alone in representing the group of social sciences in the higher education of the world. During the last twenty-five years, however, several others have been added. The rapidity with which they have come into scholastic favor may be inferred from the fact that courses in the most complex and difficult of them all, namely sociology, are now provided, in fact if not in name, in universites of almost all the leading countries. About four hundred of the higher educational institutions of the United States are now teaching sociology, almost all of them having introduced the subject within the last twenty-five years.

As to instruction in the social sciences in secondary and primary education, the tendency is toward its general introduction. France enacted a law in 1882 providing that primary instruction should embrace moral and civic instruction, and some common notions of law and political economy. In the secondary schools of other European countries they are gradually being introduced in a less formal way. In few of them, however, do any of the more recent social sciences form a separate and important part of the organized curriculum. In the United States they are rapidly making their way, a considerable percentage of the secondary schools having formally introduced them. In perhaps a still larger percentage they are taught informally. There is strong reason to believe that as the collective consciousness develops the subject matter of the social sciences will gradually be pushed downward through the entire educational system. I. W. H.

See ECONOMICS; HISTORY; POLITICAL SCIENCE; SOCIOLOGY.

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SOCIAL SETTLEMENTS, EDUCATIONAL WORK OF. — The beginnings of educational effort on the part of settlement houses go back for their historical source to Frederick Denison Maurice and his associates who established the Workingmen's College in 1854. Later this group of men became powerful at Oxford and Cambridge, and their teachings found expression among their followers, first in university extension and later in the university settlements, particularly under the leadership of the Rev. Samuel A. Barnett, the founder of Toynbee Hall. An integral part of the settlement tradition from the first has been that which involves bringing to working people what is best in art and music as well as in literature and science. While the pressure of working-class conditions and needs has inevitably restricted this motive, it has continued to give distinction to the work of the English settlements. This tradition was passed on in full vitality to the first settlement houses in the United States. Stanton Coit, who founded the original American settlement, the Neighborhood Guild in New York, and the men who followed him, were loyally attached to different colleges and universities. The young women who established the first women's settlements were profoundly influenced by the then recent "gift" of the higher education for women, and were moved to repay some part of their obligation in terms of community service. In a unique way the early settlement residents pledged their belief in the higher education as a means of social reform. Working-class neighborhoods everywhere were to be made better, richer, and more joyous by bringing to their service the best that had been thought and done in every department of life. Culture, however, according to these early residents, could be communicated only through vital contact of life with life. Therefore the main reliance is not to be placed in a teaching staff, but in bringing those who lack culture into close-range, all-around contact with such as possess it.

Settlement residents recognize that their club and class work can be little more than experimental and suggestive. The recognition is also cordial and clear that it is the public school alone which brings our great double experiment of democracy and cosmopolitanism within the range of possibility. Because the common school represents the high-water mark of public interest in forming a better average type of individual, and because it is the most concerned of all public institutions in opening the gates of culture and knowledge to all the people, they give themselves wholeheartedly to fostering its work and widening its influence in every possible way.

The application of aggressive good-will to the human issues of public education at once led residents to act as educational advocates and advisers in the neighborhood. Every settlement group is morally bound to be energetic and constant in its watchfulness against any failure of public school equipment and service in its own neighborhood to measure up to the standard for the city as a whole. In many cities, settlement residents have seconded the efforts of citizens to keep school management out of politics, and in their own localities have canvassed the community, explained the issues to the people, and aroused them to the seriousness of the stake. A number of residents have served on local school boards, or as local truant officers, or in a few instances as public school teachers.

The settlement endeavors to make sure that every child of school age is attending school. A number of houses have made school canvasses from street to street in order to secure the proper enforcement of the compulsory education law. Every effort is made to induce parents to keep their children in school until they finish the grammar grades, to awaken the interest of working boys and girls in the evening schools, to send them to those classes which best meet their needs, and to find ways and means whereby children of exceptional talent may go on to high school and college. All settlements continuously bring to the attention of the people the larger educational purposes and values of the public school. In a number of instances, settlement women's clubs have been roused to a vital interest in the work of the neighborhood schools, and have contributed time and money to enhancing its resources. Public school alumni associations have been organized.

Many settlements have found it necessary, at some time, to supplement the formal public educational machinery of their neighborhoods at its upper and lower reaches. Most of the settlements of the country have maintained one or more kindergartens, in advance of their adoption by the public schools; and a number of houses are still maintaining them because the number supplied by the public authorities is not yet sufficient to meet the need. In many cities settlements have established the first evening schools, or have carried on evening elementary classes during the spring and summer in cases where there were immigrant groups who desired instruction.

In a number of cities, classes in sloyd, handicraft, and domestic science were first held in settlements, and afterwards gradually taken up by the public educational authorities. In a very unique way settlement workers have discovered and brought out the civic and moral values in club work, with its important training in association and organization. A suggestive instance of the way in which public school methods are at present being enriched is found in the teaching of domestic science. Settlements early discovered that the establishment of cooking classes in a simply and tastefully furnished apartment similar to that in which the majority of the pupils live, was the means of placing the whole subject in a much more effective light. Public schools in several cities are now securing such apartments, organized in some cases directly from settlements, and this plan of instruction is likely to be widely adopted.

Some very important educational experiments have taken the form of making the connection between the school and the home. Our system of education presupposes a well-arranged and resourceful family group capable of enforcing and supplementing the school and the teacher. Where the home is hampered in its functions, or fails altogether in some of its duties, the settlement has endeavored to organize work that would be practically effective in meeting the immediate need, and educationally valuable in assisting the members of the family to understand the cause of the difficulty and to meet it in the future out of their own acknowledged resources.

A very far-reaching contribution in this direction came with the introduction of the school nurse. In 1902 Lillian D. Wald, of the Henry Street Settlement in New York, presented to the school board a body of facts gathered by a resident, who was both a teacher and a nurse, showing the loss of time suffered by children who were excluded by the medical inspector and not properly cared for by the home. The services of a member of the nursing staff were detailed without charge to the school system for a formal experiment, and at the end of a month twelve nurses were appointed by the Board of Health. From New York the plan rapidly spread to other cities, in some of which the settlements again made the initial experiment.

One of the most highly significant methods of strengthening the relation between the home and the school has come about through the recent appointment of "home and school visitors," which is the formal name for a kind of work carried on informally ever since the settlement originated. The visiting teacher is, as it were, a trained nurse in the field of practical morals, and her duty consists in studying truant, backward, or unruly children in their homes and their neighborhood affiliations, for the purpose of discovering the causes of their delinquency and eliciting every sort of remedial resource.

The problem of the hungry and the underfed school child is, also, one that has faced the settlement from the very start. In most large cities there is an appreciable proportion of children who go to school without adequate breakfast or luncheon. Settlements have been among the leaders in carrying on experiments in providing lunches in neighboring schools. The majority of settlement residents, however, believe that money and energy would be much more fruitfully expended by bringing specifically invigorating influences to bear on the entire number of families throughout the city from which come the undervitalized children.

One of the most powerful motives of settlement residents has been that of organizing and surrounding the leisure of children and young people with the restraints and incentives of education. From the very beginning the settlements have endeavored, in scattered ways, to secure a broader and freer use of public school property for the benefit of all the people. One of the first forms which this work took was the establishment of vacation schools, and in a number of cities settlements carried on the first summer classes and later induced the educational authorities to assume the expense. In several cities also settlements have brought about the use of public school playgrounds for children after school hours and during the summer.

The influence of settlement residents in promoting the afternoon and evening use of the school plant for social and recreative purposes has been powerful and far-reaching. Settlement club and class work has been a constant stimulus and challenge, and in addition settlement residents in the large cities have been persistent in their endeavor to secure school halls for public lectures, entertainments, meetings of school alumni associations, and parents' meetings. This entering wedge has been used to secure other privileges, such as the use of the school gymnasium, the opening of rooms for musical clubs, cooking classes, and other purposes.

Ultimately those who are advocating the larger use of public school buildings hope that the school may be made the educational and recreation center for each local community. (See School as a Social Center.) Within late years this motive has grown with great rapidity and is finding widespread expression with little direct contact from settlements. The same may be said, with much greater emphasis, of the playground as one of the earliest extensions of educational service which the settlement undertook. It must be said, however, that the settlement holds strongly to the necessity of adequate trained leadership for all such effort, and for its systematic integration with neighborhood life.

The need of training for the earning of livelihood very early led settlement residents to establish classes in the handicrafts; and such instruction, together with the settlement initiative in the campaign of vocational education which followed, was largely instrumental in precipitating the present public interest in industrial training, vocational placing, and various other tendencies toward making the necessary articulation between the home, the school, and the workshop. Residents of settlements have served on public commissions, prepared exhibits, and given much time to organizing campaigns in this interest. An important outgrowth of settlement experience in promoting industrial education was the discovery that the two years between fourteen and sixteen are practically wasted in the case of the child who goes to work at fourteen. The labor of children of this age is of value only in the parasitic industries, such as that of cash girl and messenger boy; and the occupations leave their victims less equipped for life than when they left school. These two years are recognized by psychological experts as having very high value for purposes of education and perhaps particularly for training for industry. The majority of settlement workers now hold that in the near future, as public facilities for trade education develop, the compulsory period of school attendance will be raised to sixteen years of age, — the "two wasted years," in all cases where they end the child's education, being reserved for industrial training.

The important influence which the settlements have exerted, by reaction upon the educated classes and upon higher educational institutions, academical and professional, toward the fuller social application of every sort of special capacity and training, is generally recognized. It will doubtless stand as one of the important educational services of the settlement that it directly and indirectly objectifies to the men and women who are assuming leadership in the various fields of human endeavor the place of the expert under the more and more dominant conditions of democracy.

R. A. W. and A. J. K.

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SOCIAL STUDY. — See Social Sciences; Sociology.

SOCIALISM AND EDUCATION. — Socialism is primarily a theory of possible social organization, and in its strictly scientific aspect a proposed explanation of social development. Its future depends upon the prevalence of its own peculiar economic and social philosophy. Hence socialists the world over are naturally and deeply interested in education as a means of promoting their own cause. Most, if not all, socialist parties maintain a thoroughly organized system of propaganda, embracing not merely the dissemination of socialist literature, but also the promulgation of socialist ideas by a variety of forms of teaching. They maintain lecture bureaus, encourage the establishment of schools for teaching political and social science from the standpoint of socialism, and seek to promote in universities, colleges, and the common schools, an intelligent interest in socialism. In America socialists have organized an Intercollegiate Socialist Society with chapters in about fifty higher educational institutions. They maintain a Teachers' Bureau to facilitate the employment of socialist teachers; they organize socialist Sunday schools; and at every national convention of their party an exhaustive report on education is presented by a special committee on education. A similar interest and similar methods are manifested by the socialist parties in other countries.

Socialists maintain that the education of to-day is dominated by their enemies, namely, the capitalist class, and is used to promote the stability and perpetuate the interests of that class. They believe that the facts of history are colored, sometimes suppressed, for these purposes. Hence, as a matter of self-interest, and for the sake of what they believe to be the truth, they demand important changes in educational theory and practice.

There is another consideration quite as effective, perhaps, as the desire for party success in determining the attitude of socialism toward education. Socialism proceeds from the moral demand for equality of opportunity. Every child, it maintains, should have an equal opportunity with every other child for the full development of its physical, mental, and moral capacities. Under the operation of the capitalistic system, children of the poor may have no opportunities at all, or only such as are proportionate to the economic condition of their parents; or at best such advantages as are provided by free elementary schools. Socialism demands free, secular education for all, not only in the elementary schools, but also in the higher educational institutions. It favors compulsory education in the common schools, and the determination by proper tests of those who are fit for the higher education. It urges the necessity of vocational education in useful pursuits, but warns against the assumption that the value of its product is of superior importance to the development of the child.

Socialism, then, both from self-interest and from the nature of its philosophy, is obliged to recognize the great importance of education, and this recognition is manifested by the socialist parties of all countries. There is no national socialist convention without educational discussion, no socialist platform without its educational demands. The socialist party of the United States has incorporated in its most recent national platform a demand for "further measures for general education, particularly for vocational education in useful pursuits," and that the Bureau of Education be made a Department. I. W. H.

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SOCIETIES, EDUCATIONAL. — See Educational Associations; Teachers' Voluntary Associations.

SOCIETIES, STUDENT. — See Student Life.

SOCIETY. — See Social Consciousness; Sociology.

SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE or S. P. C. K. — An organization established in England in 1698 by Thomas Bray (*q.v.*), and intimately connected with the development of English elementary education. The second and third resolutions discussed at the first meeting of the Society held on March 8, 1698–1699, were proposals to establish catechetical schools in each parish in and near London, and to provide for such education in a bill for employing the poor. On March 10 it was decided to "subscribe a stock for the insurance of the charge of setting up schools for promoting Christian knowledge." Money was soon obtained for the establishment of these "charity schools" (*q.v.*), as they were called. The society has always been connected with the Church of England and masters had to be members of that church. Reading, writing, and catechism were the subjects of instruction and the end in view was the elimination of vice and degradation then prevailing among the lower classes. Manual work was added to the curriculum at the Greycoat School, Westminster, in 1701, and in 1712 spinning, sewing knitting, gardening, plowing, harrowing, navigation, and mathematics appear at different schools, while the Society took care to apprentice some of the boys. In 1703 it was proposed to establish a training school for masters, but nothing was done at this time. From 1704 to 1877 an annual charity school service, attended by the charity school children in London at Christ Church, Newgate (1704–1781), and at St. Paul's Cathedral (1782–1877), was conducted. With the establishment of the National Society (*q.v.*), the S. P. C. K. surrendered to it the care of the schools, but continued for a long time to give assistance in religious education, and with the National Society opposed the establishment of any national nonsectarian scheme of education. The S. P. C. K. furnished Bibles, New Testaments, prayer books, etc., and in 1831 established school lending libraries. This led in 1831 to the establishment of a depository and the publication of books. In 1870 the S. P. C. K. granted £10,000 for building and enlarging church schools and made additional grants in 1874 and 1892. In 1871 the society gave £3000 to establish a system of diocesan inspection of religious education. From 1849 to 1877 the society generously assisted many Church of England training colleges and offered prizes to pupil teachers for religious knowledge. In 1877 the society founded its own training college, St. Katharine's College, Tottenham. To secure a supply of a native clergy the S. P. C. K. has contributed largely in all the British colonies to the funds of Church of England colleges and universities and theological schools. Among other activities now conducted under the society may be mentioned the following: the translation and publication of the Bible and prayer-book into foreign languages and selling them at cost or less; the production and circulation of religious books, tracts, and other works, and distributing such among reading rooms, missions, churches, seamen, sailors, etc.; the conduct of a home mission and of education in the support of Church of England day and Sunday schools; the conduct of foreign and colonial missions.

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SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE. — An organization formed in 1825 as a result of Brougham's *Observations on the Education of the People,* for the purpose of publishing instructive books at a cheap price for the education of the people. With Lord Brougham (*q.v.*), one of the leaders in this Society was Matthew Davenport Hill (see under Hill, Thomas Wright). The introductory volume, by Brougham himself, appeared in 1827. In 1836 the Society included in its series *The Schoolmaster; Essays on Practical Education,* containing works and extracts from leading educational writers and magazines.

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Society for the Diffusion of Useful Knowledge. *Address of the Committee, June 1, 1843, containing a List of Books;* and *Address of the Committee,* 1846. (London.)

SOCIETY FOR THE PROPAGATION OF THE GOSPEL IN FOREIGN PARTS. — Founded by Royal Charter in 1701. Its general purpose was to act as an auxiliary to the Church of England in the English colonial possessions. More specifically its aims were (1) the revivifying of the churches already founded by supplying them with more adequately trained ministers; (2) the planting of churches in places where they had never been before or where they had fallen into decay; (3) the training of children in the tenets and worship of the church through the direct agency of schools. The organization of the society was patterned after that of the Society for Promoting Christian Knowledge which had been formed three years earlier for similar work in Great Britain and the colonies. After 1701 the S. P. C. K. confined its activity nearly altogether to Great Britain and left the distant field to the S. P. G. The membership of the S. P. G. numbered 300 during the eighteenth century and was composed of the prelates of the church and many of the clergy and representative communicants. Funds were acquired by means of subscriptions from the members, royal benefactions, collections in the churches at stated times, and gifts and bequests. From 1701 to 1780 the society expended approximately £350,000 on the work, fully two thirds of which represents the benefactions in the original thirteen American colonies. Missions were established in these colonies to the number of 340. The church, it was felt, was on a satisfactory footing in Virginia and Maryland and little work was carried on there. But all of the other colonies were benefited to some extent. Chief interest, however, was shown in New England, the middle colonies, and South Carolina. Of any single colony, New York received the greatest attention both in the number of missions and in the number of schools.

The society's support of schools in New York province began in 1704 and continued until 1782. From 1710 to 1776 between five and ten elementary schools were continuously maintained and more than fifty schoolmasters were given assistance. Such schools were chiefly located in the city of New York; on Staten Island; on Long Island at Hempstead, Jamaica, and Oyster Bay; in Westchester county at North Castle, Rye, and West Chester; in the upper province at Albany and Johnstown; and among the Mohawk Indians.

Instruction in church catechism was provided for the slaves in various parts of the province, and a catechetical school was carried on in New York City from 1704 until the Revolution.

The pupils in the elementary schools numbered from about twenty to as many as eighty-six. The usual enrollment was approximately forty. The society's support involved assurance from the schoolmasters that a specified number of pupils should be taught gratis. This policy was a guarantee of free tuition to some extent in all the schools. Accordingly nonpaying scholars were in the proportion of one fourth to one half of the enrollment. Except for about two years, the school in New York City was absolutely free during the entire century.

School support began in New Jersey in 1712 at Burlington, the society maintaining a school there until nearly 1740. Shrewsbury received similar assistance from about 1743 to 1763. Second River was assisted from about 1756 to 1777, Elizabethtown from 1748 to 1754, and a schoolmaster at Amwell was voted a gratuity in 1773. Bounties were allowed to schoolmasters in Chester, Pa., between 1712 and 1748, and in Lancaster between 1771 and 1778. Assistance was voted for the towns of Lewes and Oxford on a few occasions, this being either in money or books. A free grammar school was maintained at Philadelphia during most of the century. It was under the care of the S. P. G. agents and received some assistance from the Society, but the principal support was a royal bounty of £30 yearly. This grant was made as a result of representations from the society to the crown. Through frequent urging it was continued with a fair degree of regularity. From 1745 on, a catechist was supported at Philadelphia by the society for work among the slaves.

As early as 1707 two free schools seem to have been attempted at Boston in Massachusetts but could not have continued any length of time. Between 1720 and 1738 two of the town schoolmasters, who were of the church of England, were allowed an additional salary of £15 per annum by the society. In the years 1743–1745 inclusive a catechetical school was attempted at Boston. In 1766 and again in 1773 encouragement was given to a school in Salem. A greater amount of aid was given to Connecticut and Rhode Island. In the former colony the town of Fairfield was given assistance for a number of years following 1727 and 1738 respectively. A schoolmaster was supported at North Groton from 1745 to about 1761, and this was also true of Stratford from 1727 to 1752. In Rhode Island schools were partially maintained at Narragansett, 1723–1725 and 1726–1728, and at Providence from 1731 to 1778. At Newport, however, the grammar school was almost continuously assisted during the years 1721–1771.

Of the Southern colonies South Carolina received most of the society's attention. A schoolmaster was supported in Charleston as early as 1705 and until 1709. Between 1711 and 1731 the S. P. G. and the provincial government coöperated in carrying on this school, and a catechetical school for negroes was maintained between 1742 and 1764. Other assistance was allowed to schools in South Carolina as follows: St. Andrew's parish, 1744; St. Dennis's parish, 1721–1730; St. Paul's parish, 1726–1728; St. Thomas's parish, 1743–1763; St. James's parish, Goosecreek, 1709 and 1711–1717; Cuffeetown, 1771–1774; and Winyaw, 1730. The irregularity of the support in this colony was due to frequent endowment of free schools by citizens and to the policy of provincial encouragement. The society encouraged a school in Newbern, North Carolina, from 1764 to 1771, and in Augusta and Savannah, Georgia, at various times during the period 1750–1775.

The society required schoolmasters to send semiannual reports which were to be certified to by the Church of England minister and some of the principal inhabitants. On the whole the regulation was not lived up to and consequently reports hardly averaged one per year. The most frequent and the most complete were those sent by the New York schoolmasters. Children were to be taught "to read truly and distinctly," "to write a plain and legible hand in order to the fitting them for useful Employments; with as much Arithmetick as shall be necessary to the same Purpose." Strict piety pervaded the curriculum. The end of education was, above all, to make the children moral and religious beings. Schoolmasters were required to teach them to read "the Holy Scriptures and other pious and useful Books"; to instruct them thoroughly in the church catechism; to use morning and evening prayers in the schools and to teach the prayers and graces for use at home. It was further required that schoolmasters oblige their scholars to attend regularly upon the services of the church and take special care of their manners, both in and out of school.

The scarcity of books was such that schoolmasters availed themselves of any they could procure. Various beginning texts were used for reading. These were hornbooks, ABC books, primers, and spelling books. When moderate proficiency had been attained pupils began to read such books as the following: Church Catechism, Lewis's *Exposition of the Church Catechism*, Psalter, Common Prayer Book, Testament, Bible, and *The Whole Duty of Man*. There were no other texts for reading than these. The society sent generous supplies of books for the use of the schools. It seems probable that a majority of the schoolbooks were from this source.

The schools of the S. P. G. represent an adaptation of the charity school work of the

S. P. C. K. to the educational needs of the church in the colonies. In such cities as Providence, New York, Philadelphia, and Charleston the ventures were probably as thoroughgoing as were the schools in England. Elsewhere the work was only partially representative. In view of the unusual obstacles that were involved, however, the movement represents a most praiseworthy effort. There can be no doubt that it formed the foremost philanthropic work in education during the colonial period. Except in New England, the S. P. G. schools furnished the nearest approach to a public school system that was to be found among the English colonists in the eighteenth century. W. W. K.

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SOCIETY FOR THE SCIENTIFIC STUDY OF EDUCATION. — See National Herbart Society; Teachers' Voluntary Associations.

SOCIOLOGY. — Scope of the Subject. — Sociology is the scientific study of society. Men, and many of the lower animals, live in groups. The scientific problem is to discover, by means of observation, induction, and verification, quantitative expressions for the regular ways in which group life operates, *i.e.* what, in quantitative terms, are the consequences of the fact that "man is a political animal." Study of this problem necessitates inquiry into the origin, composition, interrelationships and activities of groups. It includes consideration of the environmental, biological, and psychological factors which, historically, have conditioned the character of such groups as the process of evolution has produced. It requires investigation also of such differences and resemblances among groups as are of significance in explaining the control which the group exercises over the individuals composing it. For quantitative expression the statistical method must be used. The ultimate aim of such study is to create a scientific basis for the conscious control of human society, to the end that evolution may be transformed into progress both for the race and for the individual. Unfortunately the scope of the subject has not been always thus conceived by teachers who label their courses Sociology. The latter half of the nineteenth century, the pioneer period in scientific sociology, witnessed a remarkable development of interest in the problems of philanthropy and penology. Inquiries into the causes of poverty and crime stimulated inquiry into the broader field of social causation in general, and the term sociology was used loosely to cover any portion of these fields. (See Social Sciences.) The term "applied sociology" for some time was equivalent to philanthropy and penology (*q.v.*). Recognition of the fact, however, that a theory of sociology can be "applied" in the guidance of public policy in every department of social life has initiated a movement, in America especially, to segregate the special problems of philanthropy and penology under the term social economy. This movement has not worked itself out fully, and there are still many courses given as sociology that should be called social economy. Sociology, in the scientific sense, of necessity uses the materials of history, and the demonstration or the concrete illustration of sociological principles has led naturally to systematic treatment of the historical evolution of society. It has been customary, therefore, to include, as a legitimate part of the scientific study of society, the history of social institutions. Beyond these limits there is a more or less indefinite zone of subjects such as social ethics, civics, social legislation, or even certain special questions in political economy and philosophy that have been included under the term sociology. The popular tendency, however, to make the term cover discussion of any social question whatsoever is gradually disappearing.

The present status of sociology as a science has been a direct result of the history of the subject itself. No one has yet done for sociology what Marshall did for economics. None of the textbooks is entirely satisfactory nor has entire agreement yet been reached as to the subjects which should receive most attention in a fundamental course. Nearly all the pioneers in sociology, with the exception of the very earliest, still retain leadership both in the science itself and in university chairs. Though all such leaders agree on fundamental points, each has naturally emphasized in his teaching that phase of the subject to which he has contributed most. At the present time, however, both the leaders and the large body of younger teachers who have been trained by them are beginning to place somewhat the same relative emphasis on the various factors that have been found useful in explaining the problems of the science. Nevertheless, even now the teacher is compelled to organize his own courses to a considerable extent on the basis of his own reading and such special training as he may be fortunate enough to have had. The particular form which that organization takes in any given instance is usually dependent to a considerable degree upon the university at which the teacher has studied and upon the sources with which he has become familiar. The conditions which have made this situation inevitable can be appreciated only by understanding the history of the subject itself and thus realizing both the richness of the field and the freedom in choice of material which is open to the teacher.

History of the Subject. — The beginning of sociology, in the study of society itself, must have commenced far earlier than historical records permit proof of the fact; for the propensity of individuals to take thought as to how a group of men may be controlled can hardly be considered a recently acquired trait. Primitive man early developed systematic methods for teaching youth the means whereby both nature and man could apparently be controlled, and the teaching of that part of primitive magic which pertained to social control must have constituted one of the first courses in sociology. Problems of warfare, leadership, and group dominion must have also led both to practical knowledge of the nature of group activity and to the transmission of that knowledge from generation to generation.

Of necessity the statesman has ever been a sociologist. Likewise the philosopher has always busied himself with the relation of man to his fellow man. When Plato wrote the *Republic* and Aristotle the *Politics* the philosophical study of the subject was well advanced. A considerable part of the education of a Grecian youth was thus definitely in the field now called sociology. Later, when the evolution of world-empires led to the study of how great bodies of heterogeneous groups might be maintained in a single organized and harmoniously working system, men began to construct theories of group action, *e.g.* those of sovereignty and of the contractual nature of the state. Machiavelli, Bodin, Hobbes, Locke, and Rousseau each added elements to the growing body of social theory and helped to render the theory of group action more precise. Finally, in the nineteenth century, when the bounds of knowledge had become world-wide, when the development of the natural sciences had demonstrated the utility of exact scientific method and when the rise of modern nations, the growth of the industrial system, the ideals of democratic government, and the theory of evolution had begun to influence men, Comte and Spencer led the way in the construction of a comprehensive theory of society, utilizing scientific method to elucidate modern problems of social evolution and of social progress. August Comte (*q.v.*) first used the word sociology in the *Cours de Philosophie positive*, and it was he who first insisted upon the use of the positive method in the development of the subject. It was Herbert Spencer, however, who in *Social Statics*, in the various volumes of the *Synthetic Philosophy*, and in *The Study of Sociology* attempted by wide observation to demonstrate that universal laws operate in human society. The work of many other men ought, however, to be included in a fuller statement of the important contributors to the development of scientific sociology in the latter half of the nineteenth century. To the influence of Charles Darwin and his kinsman Francis Galton, for example, must chiefly be credited that intensification of interest in the part which biological influences play in society which has resulted in the so-called eugenic school. (See EUGENICS.) In the comparative study of institutions the pioneer work of Sir H. S. Maine cannot be forgotten, nor in the philological method of tracing social relationships, that of the Grimm brothers. In anthropo-geography and ethnology, moreover, there were such men as Ratzel, Robertson-Smith, McLennan, Morgan, and many others. Without the work of these men and their followers sociology must have rested upon a far more speculative foundation than is now the case.

Concerning the chief writers who have followed these leaders and who have contributed more particularly to sociological theory in the narrower sense of the term, it must suffice merely to mention names and to indicate the portion of the field in which each has done his chief work. Of such writers Durkheim has particularly emphasized division of labor as the essential factor in the explanation of society; Tarde, imitation; Le Bon, the impression of the mass on the individual; Gumplowicz, the struggle of races; Ratzenhofer, the motivating power of interests; De Greef, social contact and social contract; Simmel, the forms of society and the process of socialization; Ward, the importance of human intelligence and inventiveness; Sumner, the unconscious processes in the evolution of institutions; Giddings, sympathy and likemindedness as subjective causes of the origin and maintenance of groups, the tendency to type formation, and the identification of type form with that of the group; Small, the interests to which men react and the methods of the subject; Ross, social control; and Cooley, social organization.

The competent teacher of sociology to-day utilizes the work of all of these men and that of many others who have elucidated less striking phases of the subject. If, perchance, he be capable of contributing to the science, he may be aiding in the recently inaugurated effort to place the entire subject on a quantitative basis.

The Teaching of Sociology. — The organized teaching of sociology as a university subject began long after the questions with which it deals had gained a firm hold upon the public mind. Little by little teachers of other political or social sciences which had already attained a recognized place in the educational system began to introduce sociological material into their courses and sometimes without sufficient justification to call the result sociology. Popular courses of lectures under the authority of recognized institutions of learning and dealing with almost every conceivable social question sprang up in nearly every civilized land and were called sociology. It was on this inclusive basis that in 1886 a report was made to the American Social Science Association that practically all of some hundred or more universities and colleges in the United States gave instruction in some branch of social science. A similar report could doubtless have been made for every country in Europe.

The first teaching of scientific sociology as a regular part of a college curriculum appears to have been in the United States when Professor Sumner in 1873 introduced Spencer's *Study of Sociology* as a textbook at Yale. In 1880 the Trustees of Columbia College established the School of Political Science in that institution, and in it Professor Mayo-Smith received the chair of adjunct professor of political economy and social science. The first department of social science was created at Chicago University in 1894. In the same year the first chair of sociology definitely so called was created in Columbia, and was held then, as now, by Professor Giddings.

The entire decade in which these last mentioned events occurred, however, showed a marked increase of interest, by educators, in sociology. By 1895 the University of Chicago announced numerous courses in the subject and at least twenty-five other colleges and universities in the United States were teaching sociology proper. As many more had made provision for instruction in charities and correction. In Belgium the Université Nouvelle de Bruxelles, established in 1894, with the eminent sociologist Guillaume de Greef as its first Rector, was itself launched largely because of a revolt against the conservatism of other universities with respect to the social sciences. De Greef's work is now largely supplemented by that of Professor Waxweiler and his staff of the Institut Solvay in the same city. Instruction is both in scientific sociology and social economy. In Switzerland as late as 1900 the only instruction in the subject consisted of a course by Professor Wuarin, the economist, given at Geneva, and one by Dr. Ludwig Stein, Professor of Philosophy at Bern. Italy has produced a number of sociologists of eminence, *e.g.* Lombroso, Ferri, Sighele, Ferrero, and Sergi, but even in 1900 not one of them was teaching in a university. In that year also there did not exist a single chair of sociology, so called, in Germany. Throughout the preceding six academic years, however, or during one or more of them, courses in sociology were given by Simmel (Berlin), Sombart (Breslau), Bernheim (Greifswald), Sherrer (Heidelberg), Tönnies (Kiel), and Barth (Leipzig). Schäffle of Stuttgart had also become known as the chief representative of the "organic" school. France, the land of the early physiocrats in economics and the home of Comte, was almost the last to organize instruction in the social sciences. During the first three quarters of the nineteenth century no other social sciences were taught in France than the strictly juridical and moral. At the beginning of the last quarter, however, a place for political economy was made in the examination for the bachelor's degree in law. Even in 1900, according to Professor Gide, sociology was not taught anywhere in France in the form of a regular course, but three professors of philosophy and one of law were delivering free lectures on the subject, Durkheim at Bordeaux, Bouglé at Montpellier, Bertrand at Lyon, and Haurion at Toulouse. Letourneau, however, had by this time achieved a reputation in Paris. The privately supported *Collège Libre des Sciences Sociales*, had been found in 1892, but the courses included in its somewhat glittering program consisted of but ten lectures each, and were not well attended. Nevertheless, the most celebrated of French sociologists, Gabriel Tarde, first delivered at that institution in 1897 the lectures that subsequently appeared as his *Lois Sociales*. The school was later organized as the *École des Hautes Études Sociales*. At the *Collège de France*, also, certain courses in sociology were given after 1895, *honoris causa*.

In Austria Gumplowicz and Ratzenhofer have been the most noted names. The former taught at Graz. Russia contributed Lilienfeld and Novicow, but did not establish chairs for them. In Great Britain there was no chair or lectureship in the subject in any university prior to 1904 in spite of the fact that the Sociological Society was already in existence. The first important systematic series of lectures on sociology in the University of London was given in that year. Prior to that, however, Professor Geddes had been lecturing in Glasgow, and at the London School of Economics the sociological movement had received encouragement.

Such were the beginnings of systematic instruction in sociology. It is not practicable here to follow in detail the later development of the movement in all countries. The United States has introduced the subject in institutions of learning more rapidly than has been the case elsewhere. Nevertheless there has been advance in all countries. The present status of the subject in educational institutions in the United States is well reflected by the report of December, 1910, upon the questionnaire issued by the committee on the teaching of sociology of the American Sociological Society. The questionnaire was sent to 396 institutions, of which over 366 were known to give courses in sociology. One hundred and forty-five replies were received. One hundred and twenty-eight institutions reported one or more courses in sociology. In addition to universities and colleges, five theological and twelve normal schools answered the questionnaire. In an effort to gauge the character of subject matter chiefly emphasized in the 128 institutions the number of times various types of subject matter were specifically mentioned in the replies was tabulated and resulted in the following classification and marks: historical subject matter, 84; psychological, 80; practical, 56; economic, 22; descriptive and analytic, 21; biological, 16; In addition, definite reference to "sociological theory" occurred 40 times and to "social pathology" 13 times. Under the first subject was included specific mention of anthropology, ethnology, institutions, and social evolution; under the second, social psychology, association, and imitation; under the third, congestion, housing, philanthropy, criminology, and "social problems"; under the fourth, industrial and labor conditions and socialism; under the fifth, physical influences and the study of a specific social group; under the sixth, eugenics and statistical treatment of population. These figures and classes do not imply exclusive or preponderating attention to any one of the classes of subjects mentioned, but merely indicate roughly the type of sociological subject matter which is primarily emphasized in the educational institutions of the country at large. Eighty-six specific suggestions for subject matter to form a fundamental course distributed emphasis as follows: historical, 28; psychological, 25; practical, 16; biological, 7; descriptive and analytic, 7; economic, 3. The same report includes a statement of texts and authorities cited in five or more replies to the questionnaire.

From the foregoing it is possible to understand clearly why sociology has not as yet made its way into the high school. The subject is already beginning to find a place in the curricula of normal schools, however, and sooner or later it will make its way in a simple form either to supplement or eventually to precede elementary courses in economics, civics, and history. Logically, a discussion of the fundamental bases of social organization should precede any of the questions that assume the existence of a particular sort of social organization, and there is, in reality, no reason at all why the essential factors that coöperate to produce the activities of social groups cannot be explained in such a way that a child may appreciate the simpler modes of their operation and thus be helped to understand later the complex relations of the social life of modern civilization.

Methods of Teaching Sociology. — The subject matter of sociology, as is evident from the preceding review, lends itself most conveniently to the lecture method of presentation — at least when it is taught as a university subject. This is preëminently true if the historical evolution of society is to be treated in an adequate fashion. No student can be required to do the reading necessary for independent judgment upon the disputed points which often baffle the expert, nor would it be possible to discuss all phases of the subject in the brief time which the ordinary student can devote to sociology. The teacher may usually consider his work in this field fairly satisfactory if he succeeds in making clear the fact that the causes of social evolution can be subjected to scientific analysis as truly, if not as exactly, as any other phenomena whatsoever, if he is able to explain how the combination of various factors — physical environment, race, dynamic personality, economic, religious, and other cultural institutions — created the various types of society that have existed from the earliest forms of tribal organization to the modern world society, if he indicates the sources of information and their trustworthiness, and if in the presentation of these subjects he develops in the student a realization of the historical perspective from which it is necessary to view mankind's development whenever rational criticism of public policy is required.

In the more closely analytical study of sociological theory more use can be made of existing texts. Even with these, however, the teacher must be ready to illustrate, explain, supplement, and criticize on the basis of reading inaccessible to the student or too extensive for him to master. Discussion of special problems in theory that arise from assigned readings in original sources is indispensable, however, if independent thinking is to be gained. For this purpose source books are a valuable aid. Many teachers have found it possible to stimulate intense interest and thought by setting each student the task of independently observing and interpreting for himself by the Le Play monographic method the phenomena of sociological significance in a concrete social group or community with which he himself is or may become familiar (*e.g.* his home town, college, or club). By collecting, through observation of such a group, data concerning situation, healthfulness, resources, economic opportunities, racial types, religious, educational, political, and other cultural traits, sex and age classes, nationality, ambitions and desire for wealth, justice and liberty, degree of self-reliance or dependence, amount of coöperation, constraint, discipline, tolerance, emotional and rational reactions, relations with other groups and other such matters, the student gains a lively appreciation of the factors which make or mar the efficiency of the group of which he is himself a member. By comparison of the results of such study in the seminar, characteristic and important differences may be made vivid and vitality given to discussion of the regular antecedents of social activities.

More general studies in demography, based on the census or other official records, and pursued in such a way as to throw light on current problems such as immigration, race questions, growth of cities, significant movements of population, mortality, birth, marriage and divorce rates, or sanitary conditions, often serve to give a concreteness to theory that could not otherwise be gained. Such work, moreover, often forms an excellent preparation for the more difficult task of analyzing the mental phases of collective activity, such as mob action and the formation of rational public opinion, or of determining the conditions under which social choice is free or controlled, conservative or radical, impulsive or deliberate, governed by tradition or based on scrutiny of evidence.

In addition to methods of this sort some teachers have even inspired their students with enthusiasm for making sociology a quantitative science by first grounding them well in statistical methods and then setting them simple though definite and concrete sociological problems that involve the use of that method. For example, it is quite within the power of any college class acquainted with such a simple text as Elderton's *Primer of Statistics* to count the number of hours per week spent by each person in a group upon such recreational activities as are carried on, plot out the result, find the prevailing tendency, apply the usual statistical measures, median, mode, quartiles, etc., and gradually acquire facility in attacking more extensive data. (See Graphic Curve.) For instruction of this character the regular meeting of seminars or practicums for report by students upon their particular tasks becomes the most convenient pedagogical device to promote independent criticism and discussion. The seminar method is also useful for the discussion of special reports upon readings in the works of the more prominent sociological writers. In order that the observational method may be successfully applied it is evident that the canons of inductive method must be thoroughly understood by the student. It is also apparent that in the review of extant theory there must be appreciation of the criteria for judging the value of evidence. Above all, encouragement must be given to every inclination on the part of the student to investigate particular problems for himself. He must be made to realize, moreover, that sociologists must be as willing to undertake protracted and laborious tasks in the assembling of data as are the biologists, the psychologists, or the chemists.

The foregoing methods are applicable chiefly to the university student. In college or in high school the methods employed are naturally more useful if they arouse the student's interest in problems that pertain to civic welfare, and if they aid him in understanding the forces that make or mar the efficiency of the particular social groups in which he is himself to play a part. For such purposes the method of studying current social problems becomes extremely useful, provided the teacher is skillful in the selection of the topics for discussion and can utilize sociological principles of interpretation. By using the ordinary facts present in every town or village, it is possible much earlier than is usually supposed to have the pupil observe significant sociological facts and become familiar with the scientific mode of interpreting them.

In addition to these simple statements of method it is, perhaps, unnecessary to remark that in the teaching of the science itself the most inspiring instructor is he who is himself able to employ successfully the usual deductive, inductive, comparative, historical, and statistical methods in the discovery of new truth.

A. A. T. and F. H. G.

See Social Sciences: also Anthropology; Civics; Economics; History; Penology, Educational Aspects of; Philanthropy, Educational Aspects of; Political Science; Reformatory Education; Statistical Method.

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For a list of textbooks, together with statistics of their use in institutions of learning, see *Report* of the Committee on Teaching of the American Sociological Society in *Publications* of the American Sociological Society, Vol. V., p. 123. (1910.)

SOCIOLOGY, EDUCATIONAL. — One of the basal subjects in the systematic study of the professional theory and practice of education, which emphasizes the social factor in education; that organized application of modern sociological thought which has special bearing on the problems of education.

The school is an institution which mediates between the child and his environment. It is an instrument of adjustment between the nature (physiological and psychological) of the child and the surrounding world (physical and human). As an instrument it has assumed special traditional characteristics (strengths and limitations), which are the product of its past experience. The special basal studies or sciences upon which educational philosophy and method rest are organized in terms of the special factors which condition the school and its work. Thus school hygiene posits the school's functions in terms of the physiological nature of the child, educational psychology in terms of his psychological nature; educational sociology interprets the school in terms of external conditions and needs; and the history of education studies the institutional characteristics of the school in all its relations, but from the standpoint of their genesis or descent. Thus educational sociology, when taken with educational hygiene (and sanitation), educational psychology, and educational history, is one of the four special approaches utilized in that scientific study of education which founds its philosophy or inclusive theory upon detailed observation and analysis.

The chief methods employed in the sociological study of education (more particularly school education) are: (1) the historical (genetic, evolutional), (2) the comparative, (3) the statistical, and (4) the critical (reflective, analytic). Because of the insuperable difficulties which baffle any attempt at an adequate control of sociological factors for scientific purposes, the experimental method has only a slight place in an educational sociology.

The problems of an educational sociology have a wide range. They extend from the determination of the school's purposes to the evaluation of the concrete activities of the teaching and learning process; from the distribution of school buildings in terms of the congestion of population to the delimiting of the school's participation in movements for social progress and reform; from a study of the effects of various distributions of school moneys to an investigation of the influence of education on remuneration and distinction. Educational theory has always assumed a social basis, but it has not made it conscious, scientific, and detailed. One of the chief advantages of modern educational philosophy over its predecessors is found in its more explicit statement of social factors. The purpose of an educational sociology is, in a specialized and scientific way, to investigate and reveal the social facts and laws upon which educational theory and practice must in large part rest. Thus with an adequate educational sociology all plans for vocational schools would rest upon social surveys of the actual vocational needs of the community; elementary school courses of study in spelling, utilizing 4000 words, would include the 4000 words socially most used and misspelled; the method of teaching a child to calculate "interest" in arithmetic would be made to conform to prevalent banking practice, etc. H. S.

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SOCRATES AND THE SOCRATIC METHOD. — The master of Plato and the most famous exponent of the analytic, skeptical drawing-out method of teaching, was born in Athens about 469 B.C. (Plato, *Apology,* 17 D), and was put to death by his fellow citizens in 399 B.C. on the charge of corrupting the youth of Athens by strange doctrines. Nothing is known of his early life and training except that his father gave him the usual Athenian education in music, letters, and gymnastics (*Crito*, 50). But two of his pupils, Plato and Xenophon, have made his personality and the character of his work in later life familiar and vivid to a degree that is true of hardly another figure in all antiquity. His grotesque ugliness, his serene good temper, his marvelous powers of concentration and endurance, his virtue, his courage, his eloquence, and his self-control are described for us with peculiar vividness by Alcibiades in Plato's *Symposium*. His philosophy and his method of teaching must be sought in Plato's *Dialogues* throughout (see for example the *Apology*, the *Euthyphro*, the *Lysis*, the *Protagoras*, and the first book of the *Republic*) and in Xenophon's *Memorabilia*.

The philosophy of Socrates was based on (1) a firm conviction of the absolute reality and necessity of virtue, (2) a belief that the one true way to virtue is knowledge, and (3) the resultant conviction that knowledge of things human, of ourselves, is the first essential of wisdom and goodness alike. This belief is set forth most clearly in Plato's *Protagoras*. No man, he believed, would willingly choose evil, any more than he would willingly lose his way or become ill, or take poison, or injure himself, if he could see the remote consequences of his act as clearly as the immediate end to be gained. The trouble is like that of the child who thinks the moon larger than the planets. It lies in an inadequate perspective, a careless and ignorant trusting to appearances, an inability to see the remote thing as clearly as the thing near by and therefore obvious. The need, as he puts it, is for a sort of moral art of measurement, knowledge of things as they really are, ability to see truth as it is without being blinded or led astray by the accident of nearness or remoteness, simplicity, or complexity. Clear, unconfused sight of truth is wisdom, and such wisdom must as inevitably lead to virtue as the clear sight of the right path means inability to lose one's way.

As a result of such a belief, the teaching of Socrates was a perpetual effort to get his pupils to see things as they are. Not by giving them new material, not by giving them his ideas, but by stimulating them to see for themselves the falsity or inadequacy of their own knowledge, did he hope to see them grow wiser and therefore better. The chief obstacle to progress in his view was that we think we know what we do not know. Realization of our ignorance, intellectual humility, was the first step toward real knowledge (*Apology*, 21). He himself was but the gnat who stung his pupil's mind into activity, the spiritual midwife who helped, not to create, but to bring true knowledge and love of truth to the birth. Often his questions, his never-ending analyses, seem irritating and even puerile, but they rested on a conviction that "to use work wrongly is not merely an error in itself: it also creates an evil in the soul," a habit of careless thinking and therefore of mental and moral blindness.

His usual method was to seize upon a word used in casual conversation and to ask for a clearer explanation of it. The explanation given was then subjected to further questioning, until as definition succeeded definition and as each was shown by analysis to be crude, incomplete, and inaccurate, the placid self-confidence of the interlocutor gave place to bewilderment, uncertainty, and often resentment. This attainment of perplexity and consciousness of ignorance was the first object of the Socratic questioning. It was now followed by further questions in which teacher and pupil, both admitting ignorance, sought to clear away the confusion arising from inadequate conceptions and to ascertain the truth. His method was usually applied to what we should call psychology, ethics, æsthetics, or politics, but in the *Meno* Plato shows how it might be applied to mathematics; and in a very true sense our "problem" method in literature and history, our experimental method in the various fields of science, are modern applications of the Socratic method. For the essence of it lies in the realization and attack of a problem, instead of the unthinking acceptance of current conceptions and the superficial evidence of the senses.

C. F. L.

For more detailed treatment of the significance of the work of Socrates, see Greece, Education in Ancient; Ethics; Logic; Philosophy; Philosophy of Education; Plato.

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SOFIA, UNIVERSITY OF. — See Bulgaria, Education in.

SOLDAN, FRANK LOUIS (1842–1908). — School superintendent; educated in the public schools of Germany. He was connected with the schools of St. Louis for forty-four years — as principal of a private school (1864–1868), instructor in the high school (1868–1870), assistant superintendent of schools (1870–1871), principal of the high and normal school (1871–1895), and city superintendent of schools (1895–1908). His publications include *Dickens' Educational Theories*, *Landmarks in Education*, *Culture and Facts;* he also translated Tiedemann's *Record of an Infant Life*, one of the earliest contributions to the literature of child study. He was president of the National Education Association in 1885.

W. S. M.

SOLDIER'S ORPHAN SCHOOL. — See ORPHANS, EDUCATION OF; also MILITARY EDUCATION.

SOMASCHI, THE, or CONGREGATION OF SOMASCHA. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

SOMATIC HYGIENE. — See HYGIENE, PERSONAL.

SOMATOLOGY. — See ANTHROPOLOGY; GROWTH.

SOMERVILLE COLLEGE, OXFORD. — See WOMEN, EDUCATION OF; OXFORD UNIVERSITY.

SOMNAMBULISM. — Walking or performing other acts while sleeping. (See SLEEP.) In a mild form this is evidenced as sleep talking. It is a physiological stigma, indicating abnormal function; complex actions being performed without conscious memory of them. It is supposed by some to be allied to the hypnotic condition (see HYPNOSIS). It is found most often at or about the age of puberty in neurotic children.

S. I. F.

SONG OR SINGING SCHOOLS. — See MIDDLE AGES, EDUCATION IN.

SONGS, CHILDREN'S. — See MUSIC IN SCHOOLS; also KINDERGARTEN; LITERATURE, CHILDREN'S; NURSERY RHYMES AND FINGER PLAYS.

SOPHISTS, THE. — A group of clever Greek teachers of the fifth and fourth centuries B.C. who laid claim to wisdom and to their ability to impart it. For the most part they were traveling foreigners who in Athens and elsewhere communicated needed information and met the demand for a developing individuality, receiving pay for their services. They are hardly to be described as a school and they were not primarily intellectual philosophers; rather were they versatile and capable teachers who by no means generally deserved the opprobrious epithet "sophist" which their critics, including Socrates, Plato, Aristotle, Xenophon, and Aristophanes fastened upon them. (The reader interested in this phase of the matter should consult Grote's sixty-seventh chapter.)

The four best known sophists were Protagoras of Abdera, Gorgias of Leontini, Prodicus of Ceos, and Hippias of Elis. Others were Polus of Agrigentum, Thrasymachus of Chalcedon, Euthydemus and Dionysodorus of Chios, Antiphon of Athens, and Euenus of Paros. These men taught all that was known at the time. They picked up information by travel and observation, and they were also originators. Their special subjects were rhetoric, politics, and grammar, in order of emphasis, but they also touched on athletics and music, tactics, and strategy, drawing and painting, mathematics, etymology, synonyms and mnemonics, geography, history, and natural history, logic, ethics, and religious criticism.

The methods they used were mainly conversations and informal discourses, sometimes peripatetic, given in short and unsystematic "courses," while stopping in a city, to its curious and ambitious young men seeking both release from custom and tradition and the means of political promotion. Their philosophy, if we may judge correctly from their critics, upon whom alone we have to rely for our information in the absence of other sources, was an assertion of individualism and a denial of universal and objective standards of conduct and thought. Protagoras taught "man is the measure of all things," and Gorgias that "nothing exists; if it did, you could not know it; if you could, you could not communicate it."

The sophists both modified the old Greek education and contributed to the new. The former home training became milder, intellectual instruction supplanted the process of forming moral habits, a knowledge content was added to gymnastic and music, the gymnastic training tended to substitute beauty for strength, and ease for vigor, and the musical training came to include the wind instruments in addition to the strings. The sophists also helped to grade studies into elementary, secondary, and higher; to popularize learning; and to substitute the study of man for the study of nature. Their destructive criticisms aroused Socrates, as Hume awoke Kant, and so the movement of Plato and Aristotle was made possible.

The greatness of their influence is to be appreciated in the light of the social transition through which Greece was just then going, which may be sketched as follows: in politics, from oligarchy to democracy; in art, from convention to originality; in history, from tradition to science; in oratory, from simplicity to adornment of style; in literature, from epic and lyric to tragedy and comedy; in religion, from traditional faith to reason; in economic conditions, from moderate means to wealth; and in philosophy, from mythology to independent thinking. These forces all mean greater individuality, freedom, initiative, and opportunity. They put a new demand on education. The sons of Greek gentlemen could not always be about their gymnastic and music, — they demanded a higher education for social utility. Hence arose the sophists to meet this demand. Mahaffy compares them to our professional university "coaches" or to our newspapers. Naturally they were met with enthusiasm by the young personality and speech, because of the desire of the youth to win personal distinction in the state, and because also of the natural intellectual curiosity of the Greeks.

The results were first great liberty of thought, speech, and action, and then great license, which not even the moral force of the Socratic movement was able fully to offset in a practical way, though it suggested the larger life of conceptual thinking and acting, in which alone sophistic teaching may be sublimated.

H. H. H.

See Greece, Education in Ancient; also Ethics; Socrates.

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SORBONNE, THE. — Founded in 1252 and opened in 1257 by Robert of Sorbon, chaplain of St. Louis of France, as a college for poor students of theology. The supreme government of the Sorbonne was in the hands of the Archdeacon, Chancellor, Doctors of Theology, Deans of the two other superior faculties, and the Rector and Proctor of the University, who appointed a Provisor or Director. The internal management was left to the fellows (*socii*). In addition to the bursars (poor students, whence the Sorbonne was known as *domus magistrorum pauperrima*), paying students were also received. The course for the doctorate of theology took ten years to complete, and included a number of disputations and theses. The Sorbonne soon acquired a reputation throughout the civilized world, and many theological questions were submitted for its decision. It played an important part in politics until the end of the sixteenth century and was marked by its independent attitude toward the Papal See. Among its important contributions was the introduction of the printing press into France in 1469. The title of Sorbonne came to be applied to the whole of the theological faculty of Paris. Membership in the Sorbonne was regarded as an academic distinction. The institution declined rapidly in the seventeenth and eighteenth centuries and was closed in 1792. In 1808 its buildings, erected by Richelieu, were transferred to the University of Paris, and after 1821 the faculties of arts, science, and theology were housed in it. In 1889 new buildings replaced those of the seventeenth century, with the exception of the Richelieu chapel, and these are now the seat of the faculties of arts and science, of the École des hautes Études (f. 1868) and the École des Chartes (f. 1897).

See France, Education in; Universities.

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SORIN, EDWARD (1814–1893). — Founder of Notre Dame University (*q.v.*); educated at the University of Paris. He became a member of the Congregation of the Holy Cross and engaged in missionary work among the Indians. He organized an institute at Notre Dame, Ind. in 1842 that two years later was chartered as Notre Dame University (*q. v.*). He was superior-general of the Congregation of the Holy Cross.

W. S. M.

SORORITIES. — See Fraternities.

SOUL. — This term is very little used in psychological discussions. In theological discussions it is used to indicate that part of the personality which is regarded as capable of independent existence apart from the body. The term is sometimes used to designate the metaphysical entity which lies back of individual mental life. Since psychology deals with the empirical manifestations of experience it cannot attempt to describe the nature and characteristics of this metaphysical entity. Modern psychology has sometimes been described to its disparagement as "psychology without a soul." Such a characterization of psychology is justified on the ground that no effort is made in the empirical science to deal with a metaphysical soul. This attitude of psychology should not be distorted into a denial that there is a soul. Empirical psychology merely refuses, like any other science, to discuss metaphysical concepts. C. H. J.

SOUND SPELLING. — See Spelling.

SOURCES. — See History.

SOUTH AFRICA, EDUCATION IN. — South Africa, a British colony with responsible government; total population, 5,985,499: Europeans, 1,278,025; natives, 4,061,082; men of Greece because of their charm of other colored races, 619,392 (census, 1911). Governor-general with administration in Pretoria (pop. 157,420). Parliament in Capetown (pop. 187,740).

Historical. — The history of South Africa, as far as European colonization is concerned, dates from 1486 when the Portuguese voyager, Bartholomew Diaz, rounded the Cape of Good Hope. For a century and a half after this date the Cape was occasionally used by Portuguese, English, and Dutch seamen as a port of call until in 1652 under a charter issued by the States General of the United Provinces of Holland, the Dutch East India Company took possession of Table Bay and established a fort there; conflicts between the new and earlier settlers were frequent. In 1795 the Cape was ceded by the Dutch to the British under General Craig, but was transferred to Holland at the Peace of Amiens in 1801, remaining for four years under the government of the Netherlands. In 1798, during war in Europe, General Baird had been victorious over the Dutch, and the British Government had unofficially looked upon the Cape as British territory; a settlement was finally reached by a convention signed in London in 1814. British rule then commenced under a governor; in 1825 an executive council was appointed to assist; ten years later a legislative council was formed, and in 1853 government by a colonial parliament was established. In 1872 responsible government was granted.

Natal was discovered by Vasco da Gama, on Christmas Day, 1497. In the eighteenth century intermittent trading went on between Cape Colony and Natal, and from early in the nineteenth Boers from the Cape continued to cross the mountains in yet increasing numbers and to settle in Natal. After numerous conflicts with the natives these Boers proclaimed a Natalian republic. British ships of war, however, arrived at the port (Durban) and drove the republicans inland where they founded Pietermaritzburg. In 1843 Natal was officially declared a part of the British Empire and in the following year was formally annexed to the Cape of Good Hope. Twelve years later it became a separate British colony and was given a limited form of representative government to be superseded by responsible government in 1893.

Previous to 1830 the Transvaal was for the most part unknown to European settlers; but after this, dissatisfied Cape Boers trekked northwards, the stream of immigration continuing to increase until the South African republic was established and legally recognized in 1852. The public treasury nearing exhaustion in 1877, the British government assumed jurisdiction over the republic, soon after which followed friction leading up to Majuba and the Transvaal War, and later to the Jameson Raid and the war of 1899 to 1902. After that it became a British colony and from 1906 until 1910 enjoyed responsible government. From 1836 onward Dutch settlers from the Cape trekking northward began to settle in the country now known as the Orange Free State; in 1845 the Cape government appointed a resident in the republic, and three years later it was annexed as a colony of the British crown. In 1854, however, it was given up to the Boers and remained in their possession until the end of the Boer War. At the peace of Vereeniging the Free State became a part of the British Empire to be governed as a Crown colony and known as the Orange River Colony; responsible government was granted in 1906. Such is a very brief outline of the history of the four colonies united by the Act of Union, which came into force on May 31, 1910.

The government of South Africa is now provided for by a governor-general, a cabinet of responsible ministers, a legislative council, a legislative assembly, and the provincial councils. With union, the central authority immediately took over the administration of university education, the lower branches to remain under the provincial authorities for five years, at the end of which period they may or may be not administered from Pretoria. We shall, therefore, deal with the different systems of primary and secondary education in the provinces *seriatim*, and later with university education in the subcontinent.

Cape Colony. — From the earliest Dutch settlement of the Cape an effort was made to provide instruction, a school for slave children being established at Capetown in 1656 and later one for both white and colored children; while under the subsequent British rule, schools rapidly multiplied. Prior to 1905 the whole educational system in the colony was voluntary, and the education of the colored population was in the hands of the missionary bodies. The School Board act of that year created municipal and divisional school boards charged with the establishment and control of European schools, at the same time giving rating powers and providing for the gradual introduction of compulsory attendance which is now in force in two thirds of the school-board areas. An amending act of 1909 provided that the government should contribute toward all approved expenditure on the pound for pound principle, the deficit being met by the local municipal or divisional board concerned, to the extent of a 1*s*. 8*d*. rate, the government paying the remainder. The school boards are more powerful in the Cape than in the other provinces, having considerable control over finance and a voice in the appointment of teachers; they are, moreover, expected to devise the best means of meeting local needs.

The professional administration of all except university education is in the hands of a director of education who is assisted by a staff of thirty-two inspectors and a clerical force of eight. The public primary schools are divided into three classes on the basis of the length and completeness of the school course and the sufficiency of the school staff. Third-class schools teach as a rule only the subjects of the elementary school course and generally not beyond the fifth standard. The standards are practically those in vogue in English elementary schools. The second-class school must teach efficiently up to standard VII and must also provide in its curriculum such extra subjects as may be most suitable to the district it serves. First-class schools again go beyond this, but do not satisfy the full requirements of a high or secondary school. In addition to these there are in the Cape district boarding schools, private farm schools, poor schools, mission schools, schools for aborigines, evening schools, and special schools, all receiving state aid. On Aug. 1, 1911, there were in existence 21 special schools, 91 first-class, 103 second-class, 1069 third-class schools, 2 district boarding schools, 20 evening schools, 901 private farm schools, 305 poor schools, 728 mission schools, and 870 schools for aborigines. In addition to the ordinary school subjects, the following special subjects are taught: music, drawing, needlework, woodwork, domestic science, physical culture, infant teaching, nature study, and elementary algebra. On Aug. 1, 1911, the department had in its employment 4935 certificated teachers (holding first- or second-class certificates), 2682 uncertificated teachers, and 2503 pupil teachers. The chief source of supply of teachers for the third-class schools is the pupil-teacher system, and the department is trying gradually to raise the standard of the pupil-teacher examination and to concentrate pupils in centers where a thoroughly sound training can be given. The colony has four European training colleges and eleven native training schools. Teachers for the second-class schools are drawn chiefly from the European training colleges, and the higher posts in the service are mainly filled by European graduates or those of the University of the Cape of Good Hope; at the same time it should be noted that the Cape supplies numerous teachers to the other provinces.

In 1899 a beginning was made with the secondary school system, when a number of first-class schools were given more highly qualified teaching staffs, improved buildings, and better equipment. There are now forty-five of these schools doing work up to the matriculation standard of the Cape University. In 1906 a special inspector was appointed for their supervision and control.

Natal. — The government of Natal first began to educate European children in 1849, when a school was opened at Pietermaritzburg. In the following year, Durban obtained a school also. The first board of education was appointed in 1873, and in 1877 a law was passed bringing public education under a council of education, which was to appoint inspectors to work under the director of education, the latter officer hitherto having been a medium through which the governor in council had controlled education in Natal. The colony obtained responsible government in 1894, on which date the council of education disappeared, and henceforth the minister for education exercised authority through the director and his staff.

The principle at the root of the Natal system of education is that the state is wholly responsible for the primary education of its children. All European children are compelled to attend some school unless their education is otherwise provided for, certain exemptions in the case of poverty or difficulty of transport being granted. About two thirds of the European children are educated entirely by the state, and the remainder by denominational or private bodies subsidized by the government. Wherever the circumstances justify it, government schools are substituted for subsidized schools.

The administrative staff consists of a superintendent, a secretary, five clerks, three inspectors, three assistant inspectors, and two subinspectors of schools. By act 5, 1910, it was enacted that advisory school committees might be constituted for all municipal and local townships and for government-aided schools outside boroughs and townships, the function of such committees being to offer advice to the department of education on any matters relating to education. All the European primary schools of the province are either supported or aided by government; of them fifty are government schools and ninety (many of them farm schools) are state-aided schools. For the Indian population there are five government and twenty-nine aided schools, and for colored children two of the former and twenty of the latter. The province also has two art schools and a training college for teachers, as well as two schools that may be defined as a combination of evening-continuation and preparatory-technical schools. The education of the natives is undertaken by various missionary organizations which are in receipt of government aid, subject to the satisfactory reports of the government inspector. Pupils attending government schools are charged fees ranging from 1*s.* to 5*s.* per month, but no one family pays more than 10*s.*, and remissions of fees are made in certain cases. Teachers for Natal schools are either trained for their work in the colony or drawn from overseas or from the other provinces. The Natal trained teachers are student teachers who have attended classes at the government training college, some of them taking higher work at the

University College. The department issues first-, second-, and third-class certificates.

Secondary education is provided in the two government secondary schools (Maritzburg and Durban), in numerous aided schools, and in certain private enterprise schools, all with boarding establishments attached. The fees in the government schools are 15s. per month in the lowest division and 20s. per month in the highest division.

Transvaal. — The organization of education in the Transvaal dates from 1874 (Law No. 4) when ward (or farm schools) and district (or town schools) were subsidized by the government, and instruction was given in Dutch[1] or English at the option of the parent. In 1882 Dutch was made the legal medium of instruction, but the law was not very rigidly enforced. The war (1899 to 1902) suspended most educational activity; but in 1903 an education ordinance (holding for the Transvaal and the Orange River Colony) provided for compulsory free primary education, and the instruction might be in and through Dutch up to a maximum of five hours per week. In the same year these two provinces were separated for the administration of education. The Education act of 1907 extended the use of the Dutch medium, and resulted in the government taking over the majority of the private schools.

The primary schools for European children (717 in number) are under the control of the council of education (consisting of five), the education department, and the local school boards. "The board is the local agent of the department; it inquires into local needs and advises how these may best be met. It is ultimately dependent on the central department for the execution of its wishes, the logical consequence of the fact that all moneys are provided from the central exchequer." The education department comprises a director, a secretary and clerical staff, and fourteen inspectors, with one assistant inspector. The high schools are inspected by the director, in concert with professors from the university colleges in the province. The primary schools comprise 138 government town schools, 546 government country schools (Class 1, 22; Class 2, 22; Class 3, 49; Class 4, 591), 33 government-aided schools, and one industrial school with a primary department. There are 12 government schools for colored children and 220 government-aided mission schools engaged in native education.

The teachers for the primary schools are supplied by the pupil-teacher system and their training is carried out in one or other of the three training colleges. There are three classes of professional certificate. Teachers for native schools are trained in one or other of four state-aided native training institutions. On June 30, 1910, there were in the Transvaal education service (excluding higher education) 1083 male and 985 female teachers, certificated and uncertificated taken together.

In the Transvaal at present (1912) there are six state-aided secondary schools, three for boys, two for girls, and one a mixed school. The boys' and girls' schools have classes of standard IV and V primary attainment (which may be regarded as their preparatory departments) and above these forms I–V. The mixed school mentioned takes pupils of lower attainments and retains some of them until they take the intermediate examination of the Cape University. This arrangement is, however, to end, and work in the schools will in future not go beyond the matriculation standard, after which the work is taken up by the university colleges.

Orange Free State. — Organized state education in the Orange Free State began in 1874 when a government inspector was appointed and a department of public education instituted pursuant to the Public Education act of that year, from which time steady progress took place until interrupted by the war, after which reconstruction had to take place. In 1908, shortly after responsible government was granted, the school act (still in force) was passed. This law provided public primary and secondary schools, abolished the education tax, divided the colony into twenty-nine school divisions, each with a school board of nine members, established school committees of from five to seven members, and fixed their powers, as well as pronounced upon the medium of instruction (English or Dutch). The duties of the local school committees are to bring to the notice of the education department any matter concerning the welfare of the school, to insure the good order of the premises, to take a limited part in the appointment of teachers, to fix school times (provided that the length of the school day is not affected), to exercise jurisdiction over the admission and expulsion of pupils, and such other duties as the department may delegate to it. The boards are of an advisory nature, especially with reference to the provision of schools or school accommodation in their particular districts, and have certain powers over finance. On May 30, 1910, there were 348 public and 103 aided schools in the province, and the teachers numbered 423 males and 397 females. Here, as in the Transvaal, the work of the schools has to be modified because of the dual language question. Considerable dissatisfaction and friction having arisen in connection with the interpretation of the language clauses of the act, schools arose, known locally as "council schools," supported by voluntary contributions. They were administered by an inspector whom the government had dismissed for "unsympathetic interpretation of the Education act," but they have since been taken over by the government and several of them are now doing excellent work where otherwise there would be no school.

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[1] The Dutch spoken in South Africa is of course not High Dutch but a very variable patois devoid of any standard features. An attempt is now being made to establish High Dutch, but the majority of the Dutch in South Africa still favor the Taal.

The classification and grading of teachers is performed by a council of examiners, consisting of three professors of the local University College and two other gentlemen. This council likewise conducts examinations for the teachers' certificates. At Grey University College, there is a professor of education, and teachers may there pursue a one-year course of professional training; others are provided for at the normal school and the normal practicing school. An industrial school (*i.e.* a trade school, not a reformatory), together with a preparatory technical school, provides training in the handicrafts. Native education is left to the various missionary societies which have organized mission schools, and are in receipt of government grants.

Three government schools (two for boys, one for girls) provide for secondary education; there are in addition numerous private schools and one or two of the council schools referred to in the preceding paragraph are doing work of a secondary type.

General. — In considering the development of education in South Africa one must not forget that during the Boer War the school systems were considerably disorganized; this was especially the case in the Transvaal and the Orange Free State. Splendid work was done, however, by numerous schools in the refugee camps. In the Cape the disturbance was less complete, and in Natal was limited to the more northern sections.

The Union of South Africa spent last year (1911) £1,646,818 on education other than university education, apportioned among the provinces as follows: Cape Colony, £633,423, Natal, £163,339, the Transvaal, £649,207, and the Orange Free State, £200,849. Primary education is compulsory throughout the Union except in a few districts in Cape Colony and is free except in Natal and a few special cases in the other provinces.

A rigid segregation of white and colored children has been effected everywhere except in about 15 per cent of the schools in Cape Colony, which formerly educated white and colored children together in many of its schools. The decision as to who are colored children rests with the school boards.

South Africa, it must not be forgotten, is a bilingual country, a fact which affects the schools in a striking degree. In Cape Colony in about 90 per cent of the schools the medium of instruction is English; in Natal, which is colonized almost throughout by British, the difficulty scarcely arises. In the Transvaal, the first steps of instruction are in the native tongue of the child, then English is gradually introduced and proficiency in it is regarded as a condition of promotion. In the Orange Free State there has been the most friction and trouble. The law now demands that up to standard 4 a child be taught in the language he best understands, and after this that he be taught both languages, exemption from either being obtainable at the request of the parent.

Dutch naturally enters into the curricula of all schools, which are otherwise very like the curricula of similar schools in the United Kingdom. One result of this is that comparatively few children select French or German as a school subject.

The salaries of teachers are on an incremental scale; in the Transvaal, principals of high schools, men £600–800, women, £400–600; assistants, men, £440–560, £330–425, £289–320, women, £330–435, £230–300, £200–240, according to grade. All other schools, principals, men, £500–600 (first class), £435–535 (second class), £320–430 (third class); women, second class, £370–430, third class, £260–330. In the other provinces the salaries are slightly less, since living is somewhat cheaper.

University Education. — Higher education is under the immediate control of the Union administration. It is provided by the University of the Cape of Good Hope; the South African College, Capetown; Victoria College, Stellenbosch; the Huguenot College for Women and Rhodes University College, Grahamtown; Natal University College, Pietermaritzburg; Transvaal University College, Pretoria; and Grey University College, Bloemfontein. The University of the Cape is purely an examining body at present. It grants degrees in arts, law, science, and divinity, and diplomas in engineering. The standard school examinations of South Africa are also conducted by the university. It is governed by a council which in turn is advised by a senatus (meeting for a week annually), consisting of the professors of the various colleges; certain professors are also members of the council. The university colleges prepare students for degrees of the university. Each college is governed by a council and a senate of the professors. The South African College, Victoria College, and Rhodes College have endowments and are government-aided; the others are at present maintained by the government.

In addition to these there is in Johannesburg the South African School of Mines and Technology, which teaches science and conducts courses and grants diplomas in applied science. It is in a flourishing condition and supplies trained men for the industries of the Rand.

The estimates of expenditure for higher education in 1911–1912 are as follows: administration, £6185; Cape University,

£11,750; South African College, £17,067; Victoria College, £11,344; Huguenot College, £2580; Natal University College, £6385; Grey College, £9540; Rhodes University College, £7169; Transvaal University College, £10,332; South African School of Mines, £15,668; bursaries and maintenance of teachers, £10,540; various, £960; total, £109,520.

Agricultural education is administered by the Agricultural Department; it is promoted by agricultural colleges and experimental stations throughout the Union, involving a total expenditure of £95,629. O. W.

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SOUTH AMERICA. — See ARGENTINE REPUBLIC; BRAZIL; CHILE, etc.

SOUTH CAROLINA, STATE OF. — It is located in the South Atlantic division, and has a land area of 30,170 square miles. In 1910 South Carolina had a total population of 1,515,400, and a density of population of 49.7 persons per square mile.

Educational History. — No action of any kind looking toward the establishment of schools was taken in the colony before 1710. The acts of 1710 and 1712, providing for the establishment of a free school in Charleston, represent the first legislation on the subject in the colony. These acts, however, merely provided for the admission of twelve free scholars, in return for the free use of lands and buildings, while all others were to be charged £4 each. Provision for the extension of this plan of a school beyond Charleston was made in a proviso that any country parish might grant £10 toward the maintenance of a schoolmaster, approved by the vestry. The vestries might also grant £12 toward the building of a schoolhouse in the parish. These laws provided a general plan for education in the colony, but few schools were ever organized under it. The proprietary form of government was not conducive to educational advancement, and, after the surrender of the charter to the crown in 1729, no further action was taken for nearly a century. Charity foundations and religious schools supplied all of the education available until some time after the beginning of the national period.

South Carolina formed a state constitution in 1776, another in 1778, and still another in 1790, but in none of these was there any mention of education. The constitution of 1790 was amended seven times by 1856, but with no mention of education in any of the amendments. The constitution of 1865 was similarly silent, and it was not until 1868 that any constitutional provision for education was made.

In 1811, on the petition of several counties, the legislature passed an act intended to provide a system of free schools, open to all white children of school age. The law was deemed provisional and experimental, but it remained, except for the city of Charleston, until swept away by the Civil War. School commissioners were appointed for each school by the legislature, to supervise the school. The "3 R's" were to be taught in each, with such other studies as the commissioners should direct. Three hundred dollars was appropriated for each school, while the people were to furnish the schoolhouses. Though every white child of suitable age in the district had a right to attend the school established, preference was to be given, in case of a shortage of funds, to destitute orphans and to the children of the poor. This virtually limited the schools to charity schools.

In 1812 and 1814 the school commissioners were directed to make statistical returns as to the working of the school system, and the Comptroller of State was directed to prepare forms and to collect and tabulate the returns. By 1818 not one third of the schools had made reports, so that in 1819 the distribution of state aid was conditioned upon the proper returns having been made, and in 1822 a fine was further imposed for failure. In 1828 the state comptroller was directed to keep regular accounts with the districts, and to make an annual report on the subject to the legislature. In 1836 the partition of the districts into divisions, under school trustees, the examination of teachers, and the appointment of a legislative committee to investigate and report, were provided for. The report made a number of recommendations, one of which was the appointment of a state superintendent; and concluded "that none but poor orphans and children of indigent and necessitous parents should be educated at the expense of the state." A number of the governors of the state took a broader view, urged the creation of a real state free school system, and called attention to the example set by Charleston, but without avail. It was not until after 1870 that a real state free school system was created.

In 1854 the commissioners for the schools of the city of Charleston petitioned the legislature for permission to establish a common school system for the free education of all. This was granted, and the new school system was inaugurated in 1856. The main feature of the bill was permission to levy a city tax, up to 15 per cent, to provide for the necessary schools. In 1858 the city established a girls' high school, with a normal department attached, and in 1860 the school was provided with a well-equipped high school building. The Civil War checked the development, but after its close the work was again taken up and carried forward, so that by 1880 the city had a well-organized public school system.

The new constitution of 1868 made the first constitutional provision for education in the history of the state, but owing largely to popular prejudice against this Reconstruction school system, the legislature for some years did little to carry these constitutional provisions into effect. The state, for the first time, was organized into counties, and county school commissioners (superintendents) and county boards of examiners were created. The first state superintendent of public instruction was elected in 1868, and a department of education was organized by legislative act that year. In 1870 a new act defined the duties of the state superintendent and of the county commissioners, provided for the establishment of school districts, for annual reports, for a course of study, and for a school census. In 1871 a state board of education was created, and provisions were made for uniform textbooks, a county board of examiners, examination of teachers, and the apportionment of such funds as were from time to time appropriated by the legislature.

The real beginning of the state school system in South Carolina dates from about 1877, after the close of the reconstruction period. The state superintendent that year reported the employment of over 3000 teachers and an enrollment in excess of 100,000, as against 769 teachers and 30,448 pupils in 1870. In 1878 the constitution was amended to provide for the compulsory levy of a general two-mill tax, in place of the previous legislative appropriations. The town of Winnsboro was also permitted to levy an additional two-mill tax. This marked the beginning not only of local taxation but of special acts for schools as well. This special legislation continued until forbidden by the new constitution of 1895 and covered all sorts of special permission. In this year a new school code was adopted, and this has formed the legal basis for the system ever since.

In 1895 a new state constitution was adopted, the most marked educational features of which were an increase in the general tax levy to three mills in each county; permission to levy a state tax to supply county deficiencies, with the net income from the sale and license of liquors to be devoted to this purpose; and the embodiment in the constitution of most of the prominent features of the school system so far evolved. The Clemson Agricultural College for males was opened in 1893, and the Winthrop Normal and Industrial College for females was opened in 1895. In 1899 summer schools took the place of the institutes, but these were discontinued in 1906. Little else in the development of the state school system was accomplished until after the beginning of the educational campaign in 1903.

This campaign has been continued and has borne much recent fruit. In 1904 a school library law was obtained. In 1905 night schools were included for the enrollment grants; the county 5 per cent school building aid law was passed; the state teachers' reading circle work was begun; the state board of education was given power to approve institutions for teachers' credentials; the school library law was improved; a compulsory vaccination law was passed; and South Carolina Day was designated for observance in the schools. In 1907 the high school law, with state aid, was obtained, as was a law to permit districts to bond themselves for school house building. In 1909 a law intended to equalize educational burdens somewhat and to lengthen the school term was passed, and a state appropriation was made to carry it into effect. In 1910 the maximum local tax levy was increased from four to eight mills, a building law carrying state aid was passed, and tax and pension legislation for the city of Charleston was enacted. In both 1911 and 1912 efforts were made to secure the adoption of a revised and improved school code, prepared by an Educational Commission, but without success. In 1912 an act regulating the employment of children and a law providing for graded and consolidated schools in rural districts, with state aid, were secured.

Present School System. — At the head of the present school system of South Carolina is a state board of education and a state superintendent of education. The state board of education has power to adopt rules and regulations, not inconsistent with law, for the government of the schools, for the examination of teachers, for the examination of candidates for the state scholarships in colleges, for the purchase of school supplies, for the conduct of the reading circle, and for the distribution of the appropriation to equalize educational advantages; they may prescribe a course of study for both day and evening schools; must adopt a uniform series of textbooks for both elementary and secondary schools, and must compile lists of school library books, from which purchases must be made; may grant state teachers' certificates; may accredit institutions for the granting of teachers' certificates; may review decisions on school questions, appealed from county boards; must approve all plans for school buildings for the building of which state or county aid is to be granted; and may be given other duties by law. The board serves *ex officio* as a state high school board, with power to control the grants of state aid to high schools. The state high school inspector acts as its agent. The state superintendent of education is elected by the people, for two-year terms. He acts, in part, as the executive officer of the state board, but largely on his own initiative. It is his duty to supervise the schools of the state, to visit the counties, to deliver addresses, and to awaken interest in educational matters. He makes an annual report through the governor to the legislature, and performs such other duties as may be delegated to him by law or by the state board of education. He is assisted by a state high school inspector, and a state rural school inspector.

For each county there is a county board of education and a county superintendent of education. The county board consists of the county superintendent, and two others, appointed by the state board of education, for two-year terms. It is the duty of each county board to enforce the course of study and the use of the required textbooks; to serve as an advisory body to the county superintendent and as a court of appeal for district disputes; to grant all county teachers' certificates, on examination, using questions sent out by the state board; to divide the county into school districts and create new districts; to approve of proposed sales of school district property; to regulate the times of opening and closing of the schools; to approve all grants of aid for school libraries, schoolhouses, and consolidated schools; and to conduct elections for the voting of district taxes and the organizing of high schools. The county superintendent of education is elected by the people, for two-year terms in twenty-three counties, and for four-year terms in twenty counties. It is the duty of the county superintendent to visit and inspect the schools annually, to advise with teachers and trustees, to aid the trustees in the collection of the poll taxes, to make an annual report as to claims filed and allowed, to approve all school warrants issued by district authorities, and to designate depositories for the sale of textbooks.

Each county is divided into a number of school districts, for each of which the county board of education appoints three trustees for two-year terms, with power reserved to remove the same for cause. They must provide suitable schoolhouses; may transfer children to other school districts, and may suspend or expel them; may employ teachers and dismiss them for cause; and may call school meetings of the district for consultation. They are charged with the care and management of the school property, and with the visitation and inspection of the schools. The action of the district boards of trustees in the matter of fixing teachers' salaries is subject to review by the county board of education.

School Support. — The constitutional three-mill tax is a required county school tax, levied by the county boards of education. A poll tax of one dollar, all dog taxes, and the proceeds of all district school taxes go to the school districts where paid. While the maximum rate of district taxation which can be voted is eight mills, some districts, organized under the old special laws, may vote as high as twelve mills. The net proceeds of the county dispensaries go to the counties, while the net proceeds of the state dispensaries are used to pay the state appropriations made for schools. Apart from certain specific grants, all state and county money is apportioned on the basis of a ten-day enrollment in the schools of the county or district.

Teachers and Training. — For the training of future teachers the state maintains the Winthrop Normal and Industrial College at Rock Hill, for the training of white female teachers; and the Colored Normal, Industrial, and Agricultural and Mechanical College at Orangeburg for colored students. The Memminger Normal School in the city of Charleston is a city normal school. In an effort to procure a body of trained teachers for the schools, the state board of education has approved the course of instruction in twenty institutions for white students and nine for colored students in the state, the graduates of which are exempt from the teachers' examinations. The examination questions are prepared under the direction of the state board of education, and are uniform throughout the state. State teachers' certificates are also granted by the state board.

Educational Conditions. — The conditions surrounding education in South Carolina make the maintenance of a free public school system a difficult task. There are approximately six colored persons to every four white persons in the state. In only one state (Mississippi) is there a larger percentage of colored people, and in but ten of the forty-three counties of the state do the whites exceed the blacks. The state is essentially rural and agricultural, and relatively poor.

The school term is short, being still only about an average of 100 days. A three-months' term is required by law. The elementary school course is divided into seven grades, and the high school course covers the eighth, ninth, tenth, and eleventh grades. Uniform textbooks are adopted for both elementary and high schools, and sold to pupils through depositories at contract prices. Indigent pupils may have books loaned to them free. Separate schools for the two races are mandatory. In the state there are more than seventy-five school districts which were created previous to 1895 by special legislative acts, and these enjoy many privileges and exemptions, among which are other taxing limits and freedom in the adoption of courses of study and textbooks.

Secondary Education. — The high school act of 1907 provided for aid to rural rather than city high schools, as all towns of over 2500 inhabitants were excluded from state aid.

This cut out about a score of towns, most of which maintain high schools. In 1910–1911, 137 high schools, in forty-one of the forty-three counties, received some state aid. All aided schools must offer instruction in manual training, domestic science, and agriculture, and must levy a local two-mill tax for support. Four public high schools for the colored race are reported for the state, while nineteen private and denominational schools, colleges, and normal schools, offering secondary and sometimes collegiate instruction, are open to them. Many of these are industrial in type.

Higher and Special Education. — The University of South Carolina at Columbia, and the Clemson Agricultural College at Clemson, stand at the head of the public school system of the state. The Citadel, at Charleston, the military college of South Carolina, is also a state institution, as is Confederate Home College, also at Charleston. The College of Charleston is a city college. The Colored Normal, Industrial, Agricultural, and Mechanical College at Orangeburg is a state institution offering collegiate instruction for the colored race. In addition to these a large number of private and denominational colleges assist in the work of higher education, there being sixteen listed for whites (eight of these for women only), and five as offering instruction of collegiate grade for the colored race. The South Carolina Institution for the Education of the Deaf and Blind at Cedar Springs is the one institution maintained by the state for the education of special classes.

E. P. C.

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SOUTH CAROLINA, UNIVERSITY OF, COLUMBIA, S.C. — The South Carolina College was chartered by the general assembly in 1801, and opened its first session January 10, 1805.

It continued in successful operation down to June, 1862, when its buildings were taken possession of by the confederate government, and used as a hospital until the close of the war.

Its charter was amended by the legislature in 1865 and in 1866 it was reopened as the University of South Carolina. It was again closed in 1877 in consequence of the unsettled political condition of the state.

In 1877 the charter was again amended and the university was divided into two branches — the one, situated at Columbia, styled the South Carolina College; the other, situated at Orangeburg, Claflin College.

In 1880 the branch at Columbia was reopened as the South Carolina College of agriculture and mechanics. In 1882 additional professors were appointed and the name was changed by omitting the words "of agriculture and mechanics." It retained its agricultural and mechanical departments but departments of ancient languages, of modern languages, of philosophy, and of history and political science were added. In 1884 the law school was organized. During the succeeding years, still other professors and instructors were appointed, until at the end of the year 1887–1888 the number was sixteen.

In December, 1887, the charter was again amended; and the South Carolina College was changed to the University of South Carolina, which title it has retained through two subsequent reorganizations.

In 1894 teachers' courses were added and a professorship of pedagogics was established. These courses began September, 1894, and have since been greatly enlarged.

In 1894, by an act of the general assembly, women were admitted to any course, regular or special, for which they should be qualified.

Since the reorganization of 1906 the courses of study in all departments have been largely multiplied and expanded. The law school has been greatly enlarged and the school of engineering has been added. A system of university extension lectures has been inaugurated and vital connection established between the teachers' school of the university and the public school system of the state.

The total student enrollment for 1911–1912 was 433. The faculty numbered twenty-six professors and twelve assistants.

Y. S.

SOUTH DAKOTA, STATE OF. — Admitted to the Union as the fortieth state in 1889. Is located in the north central division, and has a land area of 76,850 square miles. For administrative purposes the state is divided into fifty-seven counties, and these in turn into townships, or school districts. In 1910 South Dakota had a total population of 583,888, and a density of population of 7.6 persons per square mile.

Educational History. — The educational history of the territory of Dakota, up to its division and admission as two states in 1889, has been traced under North Dakota, State of. The state of South Dakota continued most of the laws and educational policy of the earlier combined territory. The new state constitution, formed in 1889, made detailed provision for a state school system and threw many safeguards about the various land grants made for education. A general and uniform public school system, free from sectarian control, was made mandatory. The state on its organization continued the territorial school law as it had been evolved, but the state board of education, not having been made a constitutional body, was abolished at the first session of the state legislature.

During the first ten years of statehood the new state suffered much from hard times and lack of settlers. During this time substantial progress in extending the school system was made but little new legislation was proposed or adopted. In 1896 the Springfield Normal School was established. In 1901 a school library law was enacted, which provided for $10 a year of aid for each district. In 1911 the amount was increased to $50 a year. In 1902 the school for the feeble-minded, in the asylum at Redfern, and the Northern Normal and Industrial School, at Aberdeen, were opened. In 1903 county conventions of school officers were authorized. A uniform certification law and a township high school law were also passed in 1903. In 1907 a state board of managers for the state teachers' reading circle was provided for, with state direction; a state board of examiners appointed; and the certification of teachers transferred, in part, to the state school authorities. In 1909 districts not providing a high school were ordered to pay high school tuition for eighth grade graduates; and patrons of schools were permitted, by petition, to compel the appointment of desired teachers. In 1911 high school departments of agriculture, manual training, and domestic economy were provided for; payments of transportation grants to parents were authorized; the issue of all certificates was transferred from the counties to the state; and party designations in the nomination and election of school officers were abolished.

Present School System. — At the head of the present school system in South Dakota is a state superintendent of public instruction, elected by the people for two-year terms. He is charged with the general supervision of the schools and school superintendents of the state. He holds an annual convention of the county superintendents of the state for the consideration of educational questions; renders written decisions on the school law; inspects all high schools, and accredits them to the state higher institutions; issues rules and regulations for the conduct of county normal teachers' institutes; approves a list of institute conductors, and holds a meeting with them each year to plan the institute work; approves all plans for the construction of schoolhouses; prepares all questions for the examination of teachers, grades all papers, and issues all teachers' certificates outside of cities; may validate certificates from other states for use in South Dakota; directs the annual examination on the state teachers' reading circle work; serves as a member of the state teachers' reading circle board of managers; and makes a biennial report to the governor.

While having no state board of education, the state has three state boards which possess some of the functions exercised elsewhere by such bodies. The state board of school and public lands consists of the governor and the state auditor, *ex officio*, and the commissioner of school and public lands, elected by the people for two-year terms. The elected commissioner acts as the executive officer of the board, while the board as a body approves all loans, leases, sales, and investments. A second state body is a state board of regents for the higher and special institutions of the state. This board consists of the governor, and five others appointed by him for six-year terms, each of the appointed members being paid $1000 a year and traveling expenses. This board has control of all the higher and special institutions maintained by the state; holds property and makes contracts; employs the faculties and fixes their compensations; has power to authorize courses, departments, and textbooks; may make all necessary rules and regulations, fix the requirements for entrance and graduation, and grant degrees; and has control of the funds of the different state institutions, the state treasurer acting as treasurer for the board. This body is particularly charged with the prevention of unnecessary duplication of instruction or departments in the different state institutions, acting thus as a board of control for the higher institutions of the state. The board also has control of farmers' institutes, the geological and natural history survey of the state, and the gathering of meteorological statistics. The board makes a biennial report to the legislature. The state board of managers of the teachers' reading circle consists of the superintendent of public instruction, the president of the state teachers' association, and one county superintendent, elected by the county superintendents' association. This board selects the books to be studied and outlines the reading circle work for the year.

For each county there is a county superintendent of schools, elected for two-year terms and ineligible for more than two terms in succession. He must hold a first-grade or higher state certificate, and unless eligible his name cannot go on the ballot. The maximum salary is $1500 a year. His duties include the visitation and general supervision of the schools of the county, and in towns of less than 1000 population his supervision is direct. He must hold local teachers' institutes in each institute district at least twice each year; may also hold a two days' county teachers' institute each year; and must hold an annual county normal teachers' institute of at least five days' duration each summer, employing a conductor approved by the state superintendent. He also holds a district school officers' convention each year; may order sanitary changes in any district up to a cost of $50; makes an annual examination of the district officers' accounts, and approves all district reports; acts as a medium of communication between the state superintendent and the teachers and people of the districts; may close schools, in case of the spread of disease; apportions the school money to the districts; acts as agent for the state superintendent in conducting the examinations for teachers' certificates; appoints district school trustees to fill vacancies; acts *ex officio* as a truant officer for all districts not having a truant officer; calls special elections in the districts to decide questions of organization; and makes an annual report to the state superintendent. He also serves *ex officio* as a member of the county library board, and of the so-called county board of education. This board meets annually to apportion the library grants and to designate circuits for the traveling libraries. The county board of education is in reality a county textbook commission, as its sole function is to meet once each five years and adopt textbooks for the schools of the county.

Forty-six counties are organized under the township system (*q.v.*) and eleven under the district system (*q.v.*) of school organization. Under the law, the district system may remain in the counties where it is now, but all new counties are to be organized with the township as the school unit. If a majority of the electors in the districts petition for the township form of organization, the county superintendent and the county commissioners are to declare the township so organized. Each township or district is declared to be a school district and a body corporate. For each school district the people elect a district school board of three, — a chairman, a treasurer, and a clerk, one being elected each year, and for three-year terms. The annual school meeting is a feature of the system, though the school board is elected by ballot. The annual district meeting has power to instruct the school board as to a number of matters, though the meeting cannot take from the board its right to use sound discretion. The school board of each district has general charge, direction, and management of the schools under its charge; has the care, custody, and control of the school property; must organize and maintain a sufficient number of conveniently located schools for a term of six months, though the board may combine schools and transport pupils, may make graded payments to parents, based on distance, for the transportation of their children to school, or may transfer distant children to other school corporations; employs all teachers and may dismiss them for cause; levies the district school tax, up to twenty mills, as approved by the annual meeting; and must see that the schools are taught exclusively in the English language. The people of the district, by a petition bearing the signatures of three fourths of the residents, may compel the board to employ any designated teacher. On petition of a majority of the electors of any school district, the board must provide free textbooks. Women may vote at all school elections.

Any city, town, or unincorporated town or village having a population of 100 or over, may be organized as an independent district. Adjacent territory may be annexed to the special district for school purposes and a term of from six to ten months must be maintained. For such districts a board of education of five is elected. Graded and high schools may be organized and taxes up to twenty-five mills may be levied by the board. In cities of the first and second class a city superintendent may be employed, and such may also examine their own teachers.

School Support. — The state received the 16th and 36th sections for schools at the time of its admission to the Union, a total of nearly three million acres. The sale price was fixed at appraised value, with a minimum price of $10 per acre. About one fourth has been sold, and a permanent fund of over six million dollars has so far been produced, while the remainder is estimated as worth over forty millions. The income from the invested fund and from leases of school lands is apportioned to the counties, and thence to the school districts, on the sole basis of the number of children of school census age (six to twenty-one years) in each. A county poll tax of one dollar is levied on each elector and is distributed in the same manner. Ten cents per capita is reserved by each county superintendent from the state fund for a library fund. All other income comes from direct taxation, so that about 80 per cent of the money comes from local sources.

Teachers and Training. — The state employs about 6000 teachers. The salaries paid are about the average of salaries paid in the United States. For the training of future teachers the state maintains state normal schools at Madison, Spearfish, and Springfield, and a normal and industrial school at Aberdeen. Graduates of the normal schools of South Dakota or other schools accepted as equal are certificated without examination, as are also graduates of the University of South Dakota and other accepted institutions, if the required work in education has been taken. A state teachers' reading circle is in existence and yearly examinations are held on the books read.

Educational Conditions. — The state is essentially an agricultural state. About 85 per cent of the population live in the country districts, and only about 3 per cent live in cities of 8000 inhabitants. Nearly 54 per cent of the population is male, approximately one fourth foreign-born, and about 95 per cent white. Nearly all of the non-whites are Indians, most of whom live on reservations. Germans, Norwegians, Russians, Danes, and Swedes constitute the bulk of the foreign-born element. The expenditures for education are materially above the average, the school term is long, and the school buildings are quite satisfactory. The elementary schools are well graded, and a state course of study is followed. There are few schools other than public schools in the state. Children eight to fourteen are required to attend school each day the schools are in session, though school boards may vote to reduce the required time to sixteen weeks, twelve of which must be consecutive. Children under fifteen must not work during school hours. Deaf and blind children and Indians must be educated, unless excused for cause. The educational conditions may be classed as good.

Secondary Education. — Most of the independent districts (towns and cities) maintain high schools, and the township high school has recently begun to develop. Nearly 6 per cent of the enrollment of the schools of the state is now in the high school grades. Any independent district may establish a high school of its own volition and any township or group of townships may establish a high school at some central point, a tax up to ten mills being permitted for its support. All districts or townships not maintaining a high school must provide tuition, up to an expense of two dollars per pupil per month, for all of their eighth grade graduates, in some neighboring high school.

Higher and Special Education. — The University of South Dakota at Vermillion (*q.v.*); the South Dakota State College of Agriculture and Mechanic Arts at Brookings (*q.v.*); and the State School of Mines (*q.v.*) at Rapid City stand as the culmination of the public school system of the state. Huron College (*q.v.*), a Presbyterian institution at Huron; Dakota Wesleyan University (*q.v.*), a Methodist Episcopal institution at Mitchell; Redfield College (*q.v.*), a Congregational institution at Redfield; and Yankton College (*q.v.*), a Congregational institution at Yankton, share with the State University in the work of higher education.

The state also maintains the State School for Deaf Mutes at Sioux Falls; and the South Dakota School for the Blind at Gary. The Northern Hospital for the Insane at Redfield maintains a division for the education of feeble-minded persons. E. P. C.

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SOUTH DAKOTA, UNIVERSITY OF, VERMILLION, SO. DAK. — Located by the first territorial legislature of Dakota in 1862 at Vermillion in the extreme southern part. It was not until Feb. 3, 1883, that the charter of the university was granted by the legislative assembly, and appropriations made. Work was begun in 1883. The organization now consists of five colleges — arts and sciences, law, medicine, engineering, and music. The entrance requirements are fifteen units. Graduation from the college of law, after a course of three years, admits to the bar. After a pre-medical or scientific course of two years and a pre-clinical course of two years the student takes his B.A. degree, going to the medical college of his choice for clinical work and his professional degree. The university has a campus of over sixty acres and seven buildings. The property valuation is $678,000, of which the scientific equipment is estimated at $120,000. The teaching staff consists of twenty-six professors and twenty or more instructors and assistants. The enrollment in 1910–1911 was 426 students. F. B. G.

See South Dakota, State of.

SOUTHEASTERN AGRICULTURAL COLLEGE, WYE, KENT. — See London, University of.

SOUTH KENSINGTON MUSEUM. — See Museums.

SOUTH, UNIVERSITY OF THE, SEWANEE, TENN. — Organized in 1857, by bishops, clergy, and laymen of the Episcopal church in the states south and west of Virginia, with the purpose of establishing a university in that section on the most enlarged and liberal scale for the promotion of social order, civil justice, and Christian truth. It received a charter from the State of Tennessee in the following year and acquired a domain of nearly 10,000 acres extent, on the Cumberland Plateau, at Sewanee, Tenn. Plans for active operation were, however, necessarily postponed by the Civil War, until 1868, when what was known as the junior department of the university was opened at Sewanee.

In 1871 the college department and grammar school were separately organized. In 1873 the university conferred its first degree. A theological department was organized in 1878. From 1892 to 1909 a medical department was maintained and from 1893 to 1910 a law department. In 1908 a university extension department was established which has since maintained a summer school providing lecture courses in literature, art, science and philosophy. There are maintained at present a military academy under separate organization, a college of arts and a department of theology. Fourteen units of high school work are required for entrance to the college, which confers the degrees of B.A., M.A., B.C.E., B.S., and C.E. In the theological department the B.D. degree is granted. The faculty in 1911–1912 consisted of twenty-one members and the enrollment of students in the college was 102 and in theology 17.

To the natural beauties of its location the university has added much in the character of its buildings; taking advantage of its isolation, it has made itself an educational community; and by adopting some traditions and customs of the English universities the University of the South, or "Sewanee" as it is more generally called, has enjoyed a distinction among educational institutions in the country. It is said that no institution in the country has a larger number of alumni, proportionately, who have won distinction in the world. The number of literary men who acknowledge their indebtedness to Sewanee, together with the fact that Sewanee has long been a productive literary center, attest the stimulus given by the University of the South to literary studies. Although now preparing for a further development on the scientific side, Sewanee stands for the type of small college where high standards of classical instruction are stressed. W. B. H.

SOUTHERN BAPTIST THEOLOGICAL SEMINARY, LOUISVILLE, KY. — Founded in Greenville, S.C., in 1859; compelled to suspend operations during the Civil War; afterwards resumed its work in Greenville until 1877; was then removed to Louisville, Ky., and has since grown to be perhaps the largest Protestant theological seminary in the world. It is controlled by a board of trustees, now consisting of eighty-eight members, representing thirteen Southern States. Trustees are elected by the board from nominations made by the Southern Baptist Convention. The buildings, grounds, and equipment are valued at $500,000; the invested funds are $900,000. The plant consists of four large buildings: dormitory and boarding hall, class room and office building, library building, gymnasium building. An English education only is required for entrance, but the student must be ordained, licensed to preach, or formally recommended by his church as a student for the ministry. The student body numbers about 300 each year. There is a faculty of eight members. E. Y. M.

SOUTHERN CALIFORNIA, UNIVERSITY OF, LOS ANGELES, CAL. — Founded in the year 1879, and formally opened in October, 1880. It has been coeducational in all its departments from the beginning. There are now nine colleges situated within the boundaries of the city of Los Angeles, a marine biological station at Venice on the Pacific coast, sixteen miles off, and a preparatory school in connection with the college of liberal arts. The other eight colleges are, respectively, of medicine, dentistry, law, theology, pharmacy, music, oratory, and fine arts. In the academic year 1911–1912 the total attendance was 2107, of whom 892 were in the college of liberal arts. Its campus is within three minutes' walk of Exposition Park, which has an area of 120 acres. Here the State has recently erected a State Exhibit Building at an expense of $350,000, and Los Angeles County a Museum of History, Science, and Art at an expense of $275,000, the valuable collections in which will be available to students. The college of law, situated in the heart of the city, numbered in 1911–1912 480 students, with a faculty of forty members. The total number of university graduates in 1912 was 298.

The charter provides that the trustees, now thirty in number, shall be elected by the Southern California annual conference of the Methodist Episcopal church, but no particular religious faith is required of trustees, faculty, or students. The library now includes 25,000 volumes. The yearly income is $170,000. The president since 1903 is George Finley Bovard, D.D., LL.D. C. D.

SOUTHERN EDUCATIONAL ASSOCIATION. — See ASSOCIATIONS, EDUCATIONAL; TEACHERS' VOLUNTARY ASSOCIATIONS.

SOUTHERN UNIVERSITY, GREENSBORO, ALA. — An educational institution for men established in 1859 by the Alabama conference of the Methodist Episcopal church, South. A fitting school and a collegiate department are maintained. The entrance requirements are fourteen units. The degrees of B.A. and B.S. are conferred by the university. The total enrollment of collegiate students in 1910–1911 was ninety-six, and the faculty consists of eleven members. The endowment amounts to $100,000 and the property is valued at $250,000.

SOUTHWESTERN COLLEGE, WINFIELD, KANS. — A coeducational institution opened in 1886 under the auspices of the Methodist Episcopal church as the Southwest Kansas Conference College; the present name was adopted in 1908. Preparatory, academic, collegiate, oratory, art, music, and business departments are maintained. The entrance requirements are fifteen units. The college grants the degree of Bachelor of Arts. The college is accredited by the state for purposes of state teachers' certificates. The enrollment of collegiate students in 1911–1912 was 196. There is a faculty of twenty-eight members.

SOUTHWESTERN PRESBYTERIAN UNIVERSITY, CLARKSVILLE, TENN.— Established in 1875 under the control of a group of synods of the Southern States. A college and a school of divinity are maintained. The entrance requirements are fourteen units. The degrees conferred are the A.B., B.S. A.M., and B.D. The enrollment of collegiate students in 1910 was 113. The faculty consists of fourteen members.

SPACE, PSYCHOLOGY OF. — To the psychologist, space presents a unique problem in the psychology of perception (*q.v.*). By attributing space to a combination of sensations, Berkeley opened the whole question of perceptual fusion as distinguished from the question of sensation. Since Berkeley's time many investigations have dealt with the nature of visual and tactual space, and many theories have been propounded to explain the nature of space.

Three general doctrines of space may be distinguished. According to the first of these doctrines, space is a general characteristic of all sensations. Thus James holds in his *Principles of Psychology* that every sensation has extensity exactly as it has quality and intensity. (See SENSATION.) This characteristic of extensity is not the well-defined space which is recognized in mature life, but it is the original element out of which mature space is organized. Thus, James speaks of the sound made by a cannon as having a vast, three-dimensional extensity. It is to be contrasted with the shrill sound made by a slate pencil. The elemental extensity which appears in all sensations is worked out in the course of individual experience, especially through movements. Any sensory material which can be passed over by bodily movements comes to have regular order, and this regularity of order is organized and arranged space.

Certain other writers take a position similar to that taken by James except that they restrict the quality of extensity to tactual and visual sensations, holding that other sensations are not extensive in their character, and therefore not capable of spatial organization as are touch and vision.

A second general doctrine of space is one defended by Kant and his followers. It has relatively little currency in modern psychology in the exact form in which Kant propounded it, but the influence of his authority is felt in many psychological discussions. Kant held that space is a native form into which the mind naturally throws all of its sensory experiences. He made the same statement with regard to time. Whether there is any external fact directly corresponding to the subjective space is a matter which may be left for discussion but, whether such external form exists or not, the mind is driven by its own nature to throw its sensory experiences into this form. The form is present from the beginning of experience and is instantly applied to any sensory experience which may arise. The psychological writers who follow Kant in this view, hold to what is known as the nativistic theory of space. That is, they do not attempt to account for space as a product of mental development, but they regard it as one of the fundamental characteristics of all mental operation. Again, like James, they are prepared to admit the elaboration and refinement of this form in the course of experience. The primitive spatial form, however, is not the product of experience itself, but precedes all experience as a necessary subjective form.

The third type of theory of space perception may be described in the terms of Wundt as the fusion theory. According to this doctrine the idea of space rose out of the effort which is made in consciousness to unite a large number of sensations in an orderly way. The different sensory experiences that arise from the stimulation of the retina, for example, are in the course of the development of experience arranged in some kind of serial order. The retinal sensations are given during this arrangement in serial order, a new characteristic which is relational in its type: that is, each sensation has now not merely its own quality and its intensity, but it also has some relation to the other sensations which are given with it. This relational fact differs from sensational quality and intensity. It is not a new sensation, or a characteristic of the sensation in itself, but it is a product of fusion.

Two fundamentally different types of the fusion theory may be distinguished. According to the first, the chief element in any spatial fusion is the sensation of movement. The sensation of movement has a character which differentiates it from the sensations of color or the sensations of pressure with which it is combined. Because of this unique characteristic, the sensation of movement tends to fuse more readily with two or three visual or tactual sensations than do the visual and tactual sensations with each other. Sensations of movement have thus come to have in modern psychology a very great significance in connection with the explanation of space perception. The fact that the eyes move about and consequently pass over a certain series of retinal sensations again and again, has been appealed to as a means of explaining the delicate discriminations in space of which we are capable through vision.

It has been pointed out by those who are critical of the movement sensations as the chief elements in space perception that movement sensations are very crude in their quality. Thus, the movement sensations of the eye are so vague that it seems impossible to account for the fine spatial discriminations of vision through an appeal to these movement sensations. It has been shown, for example, that the eye in its movement does not follow faithfully the contour of objects, and yet the outlines of the object are, of course, recognized with perfect clearness. If the movement sensations are not sufficiently delicate to explain the spatial characteristics of percepts, an appeal must be made to some other psychological process than that of movement sensation to explain the development of space.

At this point there arises a second type of the fusion theory. It is not necessary to regard movement merely as a source of movement sensations. Movement gives rise constantly to certain successions of sensations. The retina as it moves about receives repeatedly certain trains of color sensations and sensations of black and white. The organization of the field of vision is dependent on the fusion of these retinal sensations quite as much as upon the sensations of movement which come from the eye muscles. Indeed, it may be assumed that the succession of retinal sensations and their fusion is of much greater importance than the introduction of sensations of movement. The fusion theory in this form lays, therefore, no greater stress upon sensations of movement than upon any other phase of experience, but treats any series of sensations which can be repeatedly traversed as sources of space.

To the student of educational processes, these discussions of space are significant in that they all agree in drawing his attention to the fact that space perception is by no means a simple process. Even the first two types of theory in which extensity is regarded as a primary characteristic of all sensation, or in which space is treated as a fundamental subjective form of perception, concede that space must be refined in the course of individual experience. Every form of the fusion theory goes much farther in emphasizing the importance of development. In any case, it is seen that the perception of space needs to be trained exactly as the power of recognition of objects or groups of objects in the world needs to be developed.

Practical experience had made it clear to teachers that space perception must be trained before the recent discussions of space perception in the psychologies. It is recognized in the schools that the abstract knowledge of space which results from the study of geometry is by no means adequate to train the individual in moving about in the world. Young children can be led to recognize distance and forms very much more accurately than they do either by nature or after taking a course in abstract geometry, through a course in drawing, or through the efforts of the child to construct simple objects, which must be fitted together in regular form. The elementary school, therefore, undertakes many types of form study and many types of constructive work for the purpose of training pupils in the recognition of space relations. A very large part of nature study aims in the same direction. The outlines of familiar objects are studied in detail in order that the student may train himself in the observation and appearance of space relations.

While emphasizing the importance of space perception, it should be borne in mind that the abstract discussion of spatial relations is no less necessary than this direct concrete contact with space. The principles of geometry are not identical with the perception which one has of surface and lines. Indeed, for purposes of strict scientific reasoning, it is necessary to assume certain geometrical forms which are in no sense of the word identical with those which we perceive. A line, for example, as used in geometry must be defined as a figure having only one dimension, whereas all of the lines which are present in ordinary experience are in reality surfaces. The science of geometry is, therefore, an elaborate abstract treatment of those relations which one sees in his space recognitions. Space percepts are more primitive in character than abstract reasonings about space. The mistake of earlier generations of teachers who taught space only through geometry was to neglect direct space perception. It would be quite as much a mistake to substitute direct perception of space, as this is cultivated in drawing and constructive work, for the abstract reasonings of geometry. C. H. J.

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SPAIN, CENTRAL UNIVERSITY OF. — See Spain, Education in.

SPAIN, EDUCATION IN. — Spain is a constitutional monarchy; area 196,670 square miles; population (1910) 19,588,688.

History. — The present system of education in Spain is regulated by laws of recent date. As a formal organization it is, therefore, essentially modern; but its scholastic spirit and operations are affected by influences which have gathered force through centuries of strenuous conflict or repressive domination. Every power that has gained ascendency in Europe, from the time of Phœnician adventures, has left some memorial of its presence in this ocean-washed Iberian peninsula, the fabled world's end of the Greeks. Cordova is the modernized Corduba, the native city of Quintilian, distinguished for its school in the early period of Roman domination. Hispania, as the Romans called the peninsula, was indeed more thoroughly Roman as regards municipal organization and institutions, than any other province outside of Italy.

boards establish public schools or adopt private schools, which, if submitted to government inspection, are supported by public funds. The boards also conduct the examinations for teachers' diplomas, which therefore are of very uncertain value, and appoint the teachers of private schools. As a consequence of the large liberty left to the local authorities, they have controlled the practical operations of the system of public instruction, and, outside of a few towns, this has meant control by the clergy. From time to time efforts have been made to extend the supervisory authority of the government over the schools, but these endeavors have been offset by measures promoting the ascendency of the church. Thus a decree of October 14, 1868, permitted persons not provided with diplomas to give primary instruction, which threw the service open to members of the religious orders and others, without regard to any special preparation.

Educational Development during the Nineteenth Century. — Apart from the statutory provision the government did little for the promotion of popular education during the nineteenth century; but the cause was earnestly advocated by important officials, in particular by Señor Gil de Zárate, director of public instruction 1845–1849, Señor Mayano, the minister who drafted the law of 1857, and Señor Navarro y Rodrigo, liberal leader in 1886, whose efforts were supplemented by many private associations. Normal schools were established through the agency of a society for improving popular education, and in 1876 a Froebelian section was opened in the normal school at Madrid. The interest in pedagogic systems which this section illustrated, had been excited early in the century by a Pestalozzian movement promoted by Don Manuel Godoy, Governor of the principality of de la Paz, and Don Juan de Anduzar, who at his own expense had the works of Pestalozzi translated into Spanish and freely circulated. The *Institution libre de enseñanza* was founded in 1876 and began its public work by agitating for a congress on primary education. In 1882 the congress was called at Madrid and the association became from that time the organizing center of educational reforms, progressive and radical, in opposition to the extreme conservatism of the clericals who controlled the government policies. One outcome of the Congress of 1882 was the Pedagogical Museum at Madrid, which has survived all political changes and, by its collections, its library and publications, as well as by conferences and discussions conducted in its halls, has been a powerful agent for the information and enlightenment of Spanish educators.

The reform movements of this period related largely to the secondary schools, which in Spain, as in other European countries, determine the character of the directive classes. The example of France in this respect was contagious, and in 1845 a measure was carried through the Cortes by Señor Gil de Zárate, which provided for the reorganization of the secondary curriculum and the introduction of a practical course of instruction. But reactionary influences soon prevailed; Señor Ibanez, in a report of 1880, deplored the neglect of this provision and urged the importance of the practical courses as the only means of developing "agricultural and commercial pursuits, arts, and industry; *i.e.* all vocations which form the veritable force of nations."

The low state of popular education left the people themselves incapable of progress. The census of 1900 showed that of the entire population (18,607,674) 63 per cent (11,869,486 including infants) were illiterate, that is, unable to read or write. There had been improvement since 1860 when the proportion was 75 per cent, but this improvement was limited practically to the cities. Even in the chief centers of population, however, the proportion of illiterates was high; in Madrid, in 1900, it reached 30 per cent on a population of 530,000; in Barcelona, 48 per cent on a population of 533,000.

Recent Advance. — In view of these conditions, a special ministry of public instruction was created (1900) and an exhaustive investigation of primary education was at once ordered. From a report of the results issued in 1909 by Señor Rodriguez, the last conservative minister, it appeared that 10,000 schools would be required to overcome the deficiency of accommodations. Subsequent investigations continued under the liberal minister, Count Romanones, showed that throughout the kingdom the school buildings were in great part unfit for use; the teachers were generally incompetent, their salaries meager and irregularly paid, and the inspection service poor and often wanting altogether. Men of all parties were aroused by these disclosures and supported the remedial measures submitted to the Cortes. These measures pertained to three matters: the salaries of teachers; the provision of school buildings; the improvement of normal schools.

The salaries, which were taken over to the charge of the State in 1902, are graded in eight classes ranging from 500 pesetas ($100) in places having less than 500 inhabitants, to 2000 pesetas ($400). A further advance ranging from 1000 pesetas ($200) to a maximum of 4000 pesetas was recently authorized; but the new scale cannot be met at present by reason of the depletion of the treasury. If a school is organized as a higher primary, the salary is augmented by 250 pesetas ($50). These amounts may be increased, as they are in Madrid and Barcelona, by local appropriations or by tuition fees. Teachers also have the right to a dwelling-house at the charge of the local authorities. The salaries are the same for men and women and all teachers are entitled to a pension at sixty years of age or because of disability. Toward the pension fund 3 per cent of the salaries is retained. Pending the adoption of a uniform plan for providing suitable school buildings throughout Spain, a subvention was allowed in 1909 to twenty communes to aid in this work. At the same time an appropriation was granted to the cities of Cadiz and Rodrigo equivalent to 60 per cent of the cost of proposed new school buildings.

Normal schools, which by the law of 1857 were organized as provincial institutions, were taken under the charge of the state in 1887, but so far only the two "central schools" at Madrid have been thoroughly efficient. The establishment of a higher normal school (Escuela superior del Magisterio) for the training of students, men and women, to serve as professors in the primary normal schools and as inspectors of primary schools, was accomplished by the conservative minister Señor Rodriguez. The institution, which was authorized by the cortez, June 9, 1909, is maintained by the state. The students, who have free tuition and board during their training, are selected by a competitive examination.

Classification of Schools. — In the category of public schools are included infant schools (escuelas de parvulos), primary day schools for children of six to fourteen years of age, Sunday schools for secular instruction and adult classes. Two classes of primary schools, elementary and higher, are recognized by the law, but so far little attention has been paid to grading and even in city schools pupils in all stages of instruction are found in the same class under one teacher. The practice schools annexed to the normal schools are graded, as are also several schools in Madrid occupying recently constructed school buildings.

While these efforts were in progress, the riots at Barcelona broke out (July, 1909), which resulted in the execution of Francesco Ferrer (*q.v.*). The zeal of this well-known teacher, in the cause of reform, had been manifested by the introduction into Spain of schools for the people in which instruction was given in accordance with scientific principles in modern and practical subjects, but all religious instruction was excluded from the curriculum. The lay or modern school of the Ferrer type excited a protest from the clergy upon the ground that anti-religious education is an evil in itself and directly contrary to Spanish law. In support of this position, the Concordat and the Constitution of the Monarchy were cited. The protest was subscribed by the Cardinal of Spain and all the Spanish archbishops and bishops.

As a consequence of this crisis, the conservative ministry was overthrown. Upon the recommendation of the new minister of public instruction, Count Romanones, a royal decree was issued February 3, 1910, which, ignoring the ecclesiastical protest, restricted the inspection of private schools to the hygienic conditions of the premises and to the prevention of words or deeds contrary to morals, to the fatherland, and to the laws. The program of the late Premier (Señor Canalejas) included the revision of the Concordat of 1851, the registration and regulation of the religious orders, government control of public education, and the recognition of freedom of conscience. These measures have been urged in a tolerant spirit and command general support; meanwhile the interests of primary instruction have been advanced by the organization of a special department in the ministry to deal with the matter. The general director of the division was appointed in January, 1911, and according to the first report from the new office, the local direction of primary schools will henceforth be exercised through bureaus dependent upon the ministry instead of upon the provincial councils as heretofore. The lack of funds is the chief hindrance to the accomplishment of needed reforms; but advance in this respect is noted, the credits for primary instruction having been raised from twenty-seven million pesos ($5,400,000) allowed in 1911, to thirty-two and one half million ($6,500,000) for 1912.

Secondary Education. — The scheme of secondary instruction was the subject of repeated revision during the last century, the principal modifications preceding the law of 1857 being those introduced in the program of 1845. The provisions of this measure were confirmed by the law of 1857, which declared that secondary education comprises: (1) general studies; (2) studies pertaining to the industrial professions (Title II, Art. 12), hence two distinct courses, one general in its character, the other specialized. The former is subdivided into two parts; the first, which covers two years, comprises the Christian religion, sacred history, Spanish and Latin grammar, history and geography, arithmetic, writing, and drawing; the second part, which covers four years, continues the studies of the first with the addition of Greek, rhetoric, poetry, algebra, geometry and trigonometry, natural history, physics, chemistry, living languages, and logic.

The practical course of two years is based upon the first division of the general course and includes ethics and principles of common law, and specialized courses pertaining to agriculture, technical industries and commerce, according to the needs of the locality. This division of the secondary program has thus far had little development. The secondary schools are of two classes: the *institutos*, the state institutions admitting only day pupils who enter at about ten years of age, the full course leading to the bachelor's degree; the colleges, boarding schools in charge of local authorities, which are feeders for the *institutos* and often connected with them.

The permanence of the educational traditions of the country is indicated by the close relations between the secondary institutions and the universities, a relation which has undoubtedly hindered in some measure the organization of the practical courses in the secondary schools. Academically Spain is divided into ten university districts, each under the control of a rector, whose official province includes the university and secondary schools of his district. He is assisted by a university council which acts as an advisory body. The professors of secondary and of higher education are appointed by the king; in the case of the secondary institutions one of the professors is named for the duty of director. Professors of both secondary and higher education must be university graduates having the degree of doctor or at least the licentiate in philosophy or letters.

The education of girls of the higher classes is carried on almost entirely in convent and other private schools. The Institute for Girls in Madrid, which is managed by a board of directors resident in the United States, is the outcome of a missionary school established at Santander over forty years ago by the late Mrs. Gulick. The institute has the confidence of the Spanish authorities and is bearing an important part in the present educational movements.

Statistics. — The disturbed state of the country during the last decade and the apathy of many of the local authorities have made it difficult for the minister to obtain complete statistics of primary education in the different provinces. In 1908 there were 24,861 public primary schools. The latest official report, published in 1910, shows a total of 34,954 public primary schools, including subsidized parochial schools, and 8100 private primaries. The total enrollment was 2,052,000 which was 10 per cent of the population. The total appropriation for primary schools in 1911 was 31,661,746 pesetas ($6,110,717). On the basis of the enrollment for the previous year this would give as the expenditure per pupil 15.4 pesetas ($2.97). The number of *institutos* reported for 1910 was 58, with 36,514 pupils.

UNIVERSITY STATISTICS, 1911

NAME	DATE OF FOUNDATION [1]	NUMBER OF STUDENTS
Barcelona	1450	1900
Granada	1531	1100
Madrid	1508 [2]	5675
Oviedo	1605	900
Salamanca	1243	1200
Santiago	1504	——
Sevilla	1502	1100
Valencia	1501	1700
Valladolid	1346	46
Saragossa	1474	——

[1] Several of the dates given are matter of question. *Minerva* has been followed in this respect.

[2] Reorganized 1836.

The total expenditure for education and fine arts in 1910 amounted to 52,351,347 pesetas ($10,470,000); the corresponding expenditure in 1911 was 58,524,586 pesetas ($11,704,800).

Barcelona reported in 1911 an expenditure of 330,000 pesetas ($66,000); Madrid, 1,404,986 pesetas ($280,900); Salamanca, 165,170 pesetas ($33,000).

One of the most interesting movements in the current life of Spain is the development of Catalonia, not only in economic and political affairs, but in those of art, literature, and even science. The Institute of Catalonia was recently founded by the provincial council (*Deputacion provincial*) of Barcelona, to promote historical investigations relative to the ancient civilization of the province, and also to afford a center for the publication of the works of native savants. The original plan of the foundation was limited to the historic sciences (history, archæology, literature, and law) as those most intimately related to the inherited tendencies and past traditions of the province, but in February, 1911, the president of the institute submitted a proposal for two new sections, one of Catalonian philology and the other of sciences. The proposition was adopted and the institute therefore comprises three sections: historic-archæologic; philologic; scientific.

The French school in Spain, founded in 1910 by the Universities of Paris and Bordeaux and fostered by the French government, has given a great impetus to researches in the historical records of the Peninsula. Still more important is the action taken by the Spanish government in 1907 for sending a few students of unusual ability to study science and technical branches in foreign countries. The effect is already seen in the decree establishing a college of agriculture with provision for experimental and research work.

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SPANISH, STUDY OF. — See Modern Languages.

SPARTAN EDUCATION. — See Greece, Education in Ancient.

SPASM. — A violent contraction (continued-tonic; alternating-clonic) of muscles, singly or in groups. When repeated they are called convulsions (*q.v.*), and if a tonic spasm be long continued it may result in a contracture. (See Chorea; Epilepsy; Movement Disorders; Paroxysm; and Tic.) S. I. F.

SPEAKING. — See Debating; Declamation; Opening Exercises.

SPECIAL CLASSES. — The term "special class" is used in two senses, a generic and a specific. In the wider and more correct usage, it applies to any form of class provided for a group of children who are in some way exceptional and who cannot, therefore, be instructed to advantage in the regular classes of the school system, either because they fail to receive the instruction suited to their special needs or because they receive such instruction at the expense of the remainder of the class. Exceptional children (*q.v.*) may, for convenience, be divided into four main groups, according as they are exceptional morally, mentally, physically, or environmentally. Special classes have, accordingly, arisen in a variety of forms to meet the needs of these four classes. (For further information, see special articles dealing with habitual truants, incorrigible pupils, epileptics, supernormal children, blind, deaf, stammerers, cripples, open-air classes, tuberculosis, etc.)

Special Classes in the Public Schools. — In the narrower and less exact usage, "special class" refers specifically to public day-school classes for children of subnormal mentality. These classes have had a remarkable development during the past decade. They represent an outgrowth and extension of the training school for feeble-minded children (see Defectives, School for). Their genesis has also been hastened by other factors, particularly by the passage and enforcement of rigid compulsory education laws, *e.g.* in France in 1882 and in the United States about 1890; by the advent of medical inspection and examination; by the statistical study of retardation in school progress; and by the elaboration of satisfactory psychological tests of mental status.

Attention to the needs of subnormal children in public schools began in Germany, however, as early as 1867, and there has since developed in that country an extensive system of auxiliary classes (*Hilfsschule* and *Hilfsklassen*), reaching practically all cities and towns of any size, so that, in 1907, 12,734 pupils were under instruction in 204 special classes. Special classes were organized in Norway in 1874; in England, Switzerland, and Austria about 1892. In the United States the first provision for backward children in a public school system was made at Providence, R. I., in 1893. The movement spread to Boston and Springfield, Mass., in 1898; to other large cities in the years immediately following. The most recent enumeration (1911) places the number of American cities making special provision for backward children at 207 and for defectives at 94.

The Selection of Pupils. — In the ordinary school population, about 0.5 per cent of the children are so seriously defective (idiots and low-grade imbeciles) as to warrant removal to institutions for the feeble-minded. Above these there is a group of higher grade feeble-minded children, ordinarily estimated at 3.5 per cent, that are educable in special classes in the public schools, but cannot be restored to normality or trained to become self-reliant and competent citizens. Above these there is a larger group of slow, dull children, who cannot be classed as mentally defective, but who cannot profit to the best advantage by instruction in regular classes. This group is variously estimated at from 10 to 50 per cent, and probably averages about 30 per cent. Ideally all pupils below average in capacity should be given a careful physical and mental examination and placed in institutions, in special classes for defectives, in special classes for the dull, or allowed, perhaps under favorable conditions to remain in the regular classes. In few, if any, school systems, however, has this ideal been approached. Evidently, in the beginning, the more serious cases, the institutional and the clearly defective, demand attention. But to decide, in individual cases, whether the pupil needs institutional care or special-class instruction is not always easy. It must be remembered that mental deficiency shades by continuous gradations all the way from normality to helpless idiocy. On the one hand, the insane, the demented, the idiot, the low-grade imbecile, the high-grade moral imbecile, and the pronounced epileptic may be classed, without question, as institutional cases, outside the scope of public school instruction. On the other hand, the ordinary slow, dull child and the child whose stupidity, however marked, is accidental and capable of removal, *e.g.* the so-called "pseudo-imbecile," handicapped by adenoids, malnutrition, etc., undoubtedly should receive instruction in public school systems. But the high-grade imbecile, the moron, and the mild epileptic form an intermediate group, difficult of administrative classification; some of them may be special-class cases; some of them may be institutional cases. The decision demands expert knowledge, which the ordinary teacher and the ordinary medical examiner cannot give. For this reason, no large city can afford to be without a special clinic for the expert physical and mental examination of all prospective candidates for special instruction. In doubtful cases, the safest plan is probably to place them in special classes until further experience dictates their removal to institutions. The French Commission of 1904 recommends a triple examination, pedagogical, psychological, and medical. The pedagogical examination determines amount of retardation in reading, spelling, and arithmetic, and here an otherwise-unaccounted-for retardation of two years in children less than nine, or of three years in children over nine, is deemed symptomatic of deficiency. The psychological examination is based upon the Binet-Simon tests (see TESTS, PSYCHOLOGICAL). The medical examination is primarily for the detection of possible remediable physical defects that might condition mental deficiency.

Aim. — The earlier classes for the feeble-minded aimed ambitiously to give a training like that of regular classes, and ultimately to restore to these classes a considerable percentage of the defective pupils. Were the pupils merely slow and dull, or were their deficiencies accidental, this aim might have been realized. But, as special classes are constituted, it is difficult of attainment. There has grown up, therefore, the conviction that the aim of the special class is, so far as its own pupils are concerned, to make them healthier and happier, to teach them the most fundamental and simple adjustments of daily life, and to drill them in occupations that may enable them to contribute in some measure toward their livelihood.

The Program and Methods. — The daily program and curriculum of the modern special class reflects this more recent aim. It differs from that of the regular classes in numerous ways, of which the most conspicuous are: shorter periods of work on given topics; classes limited in number to 15 or 20 (12 recommended in France), with correspondingly greater individual attention; special attention to lessons dealing with elementary practical details (the household, furniture, fuel, food, clothes, etc.); much concrete object teaching, using kindergarten material; emphasis on physical education, with exercises for improving physical condition (gymnastics, open-air play, calisthenics) and exercises for manual training (woodwork, cardboard construction, raffia, braiding, weaving, stenciling, card sewing, paper folding, etc.); instruction in reading, writing, and number given very gradually and rarely progressing further than fourth-grade standards; plenty of music, singing, marching, dancing, story-telling; persistent attempts at awakening moral traits and correcting individual faults (bad temper, listlessness, lying, stealing, etc.); and more elaborate and systematic taking of records of performance (card index, for instance, showing results of physical and mental examinations, physical condition, home conditions, attendance, illnesses, progress in regular classes, interests and aversions, best work and poorest work, etc.). Many classes also employ various adjuncts not regarded as essential in regular class instruction, *e.g.* simple but nourishing lunches served free or at cost at appropriate intermissions, provision for rest in the fresh air, special supervisors to oversee physical, manual, and industrial training.

Results. — No amount of special training will make a feeble-minded child normal. In occasional instances, a pupil whose mental deficiency is not innate may be restored to normality and returned to the regular class. In well-organized classes, taught by specially trained and enthusiastic teachers, most of the really defective pupils make better progress than they could possibly have done in regular classes. For example, statistics gathered by Dr. W. S. Cornell for 20 pupils in a Philadelphia special class show an average rate of progress of 0.3538 grades per year while in regular classes, and 0.8054 grades per year after transfer to the special class. Their physical health shows marked improvement; they learn to use their hands to better advantage; they gain better control of their emotional responses; they seem brighter and are undoubtedly much happier. But they still show inherent deficiency.

A matter of particular moment is the question what effect the training in the special class has upon the after-career of the pupil. We know that the mental defective is unstable; that he gives way before stresses of life which the normal person meets successfully. If special training increases his opportunity to struggle for a living, it may, by so doing, increase the strain to which he is subjected. The attainment of a measure of success may also increase the chances of his marriage and of the consequent begetting of defective offspring. Perhaps, then, we really do injury to the pupil and a greater injury to society by these special efforts to assist him. Even if we believe that the net gain is greater than the possible loss, we cannot be blind to the conclusion that there is a sociological, as well as an educational, problem in special-class education. There must be developed some system of after-care, which shall guide the footsteps of the moron after he "graduates" from the special class. School authorities must face this problem, must gather statistical data on the careers of these special pupils, and either institute or cause to be instituted adequate measures for after-school supervision.

In general, while the fundamental principle of special-class instruction seems to be generally accepted, the practical administration of these classes for defectives is still in a chaotic condition. The movement for their introduction has been too rapid to permit of intelligent adjustment on the part of superintendents, examining physicians, teachers, and parents. In France, the realization of this fact has led to the appointment of a special commission to formulate guiding principles (see Vaney, in references). The following rules (adapted in part from Cornell) seem to be justified in the present state of our experience. (1) There should be a system of special classes averaging at least one class to every two thousand school population, and so distributed as to accommodate all sections of the population. (2) Special classes should be outfitted at least as well as the average regular class, not housed in dark rooms and provided with shabby equipment. (3) There should be a definite system of transfer to and from special classes. (4) As soon as the special class is large enough for division, the actually feeble-minded should be separated from the merely dull and backward. (5) Incorrigible, troublesome, and truant boys should not be placed in classes for the merely defective just because both types exhibit poor scholarship. (6) Every candidate for special-class instruction should receive a careful medical examination and if possible also a mental examination by an expert in mental deficiency. (7) Supervisors of special classes should be chosen for their special fitness for the work. (8) Teachers of special classes should receive some special training. (9) Their salaries should be the same as the best salaries of grade teachers. (10) Normal and city training-school students should receive prescribed instruction in the subjects of practical hygiene and medical inspection, and elective instruction in the education of defective children. New York City has just now (1912) taken the lead in this work by authorizing the establishment in the Brooklyn Training School for Teachers of a course of preparation for special-class work, and by granting to a number of experienced elementary school teachers leave of absence for three months to fit themselves to take charge of special classes. The Vineland, N. J., Training School for Backward and Feeble-Minded Children also offers opportunity every summer for the training of a limited number of special-class teachers.

G. M. W.

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SPECIAL DAYS. — In nearly all countries it is the custom to observe certain special days in the elementary or people's school, in commemoration of historically important events, the birthdays of important men, or days having a special significance or a religious character. The ruler's birthday in most European countries and Washington's birthday in the United States are examples of the first; the birthdays of great statesmen, warriors, or poets, common to all countries, of the second; and saints' days, church festivals, Easter, and Christmas in Europe, and Christmas and Thanksgiving in the United States, are examples of the third. (See also Holidays, School.)

In addition to the regular holidays there are in many states special days, observed as a whole holiday or reserved for special exercises. Among these are Washington's Birthday (February 22), Columbus Day (October 12), Lincoln's birthday (February 12), Longfellow's birthday (February 27), Labor Day (first Monday in September), and the state Admission Day. Arbor Day, the date varying in different states, is also a common special day, observed by the planting of trees and by appropriate literary exercises, though seldom is it a school holiday. A few states have established other special days, such as South Carolina Day (March 18, Calhoun's birthday), Fire Day in Nebraska (first Friday in November), Flag Day in New Jersey (June 14) and in Rhode Island (February 12), and Bird Day in Louisiana (May 5, Audubon's birthday). For such special days, the state superintendent of public instruction very commonly issues a bulletin for the guidance of teachers, containing programs and exercises suitable for the proper observance of the day. In England and the British Empire generally the only day of this character — for many reasons not yet universally accepted — is Empire Day on May 24.

Another form of special day is that set apart by the individual schools themselves, for such purposes as the observance of a school festival (see Festivals, School), a display of the work done by the school, a reception of parents (see Exhibitions, School); or the final closing exercises of the school (see Commencements).

E. P. C.

SPECIAL GRANTS. — Grants of money to school districts for special purposes are generally known as special grants. These are usually made for new and desirable educational undertakings, and are in the nature of a subsidy or bonus to secure their introduction and their continuance during the period of trial and experiment. In the days when public education was first established, such grants were frequently made to communities to secure the establishment of a common school, but these have since been changed into the regular annual, semiannual, or quarterly apportionments of common school funds. (See APPORTIONMENT OF SCHOOL FUNDS.) Later such special grants were made as aid in the establishment of high schools. In some of the states these have since been changed into regular apportionments of the proceeds of taxation for high schools, while in others special grants are still continued. The Washington law, granting a bonus of $100 for each grade maintained above the eighth, is an example of such high school grants. The continuance of the process is seen to-day in the granting of special subsidies for the establishment of high schools of agriculture and domestic economy, after the ordinary high school has been provided for in the general apportionment plan. The tendency has been to convert these special grants into regular and general grants, after the establishment of the principle of such aid and the more general adoption of the educational idea aided. The state library grant, under which a number of states duplicate a sum of $10 or some similar amount, raised locally in any school district for the purchase of school library books, is another example of a form of special grant, which is rapidly being converted into a general state apportionment for school library purposes.

Within recent years, as a result of the changing conception of the nature and purpose of our education, a number of the American states have begun to make small special grants, from the state treasury or from special school funds, for the encouragement of a number of desirable educational undertakings. The Kansas grants of $250 a year, limited to forty districts, to districts levying a tax to provide instruction in industrial training; the New Jersey grants, by which any amount raised locally for the same purpose, from $250 to $5000 a year, is duplicated by the state; the California grants for the instruction of deaf children; the New York and New Jersey subsidies to towns and cities employing a superintendent of schools; the New Jersey extra grants to districts providing transportation for pupils; the Wisconsin and Minnesota extra grants to towns and districts organizing a graded school of two or more departments instead of multiplying small districts; the Delaware law providing for special grants to negro districts to build schoolhouses, and the South Carolina law by which $50 is granted from public funds for every $100 subscribed or raised locally for the same purpose; the Indiana and Connecticut grants to poor districts to enable them to provide the length of school term required by law, when they have raised the maximum tax; the special grants in New York, Kansas, Wisconsin, and other states to high schools giving training courses for teachers; and the Wisconsin and Minnesota special grants for the establishment of high schools for instruction in agriculture and domestic science, are examples of such special grants and subsidies. (For further details as to these and other grants, see the special articles on the state school systems of the different American states.)

Such special grants or subsidies are much more common in the United States than in Europe, and are indicative of new and less well-established educational conditions. In England, however, the central authority has influenced the development of the elementary school curriculum since 1862 by rearranging its annual grant and providing special grants for special subjects; similarly the maintenance of a high percentage of free places in secondary schools is encouraged by special grants. (See England, Board of Education *Report* for 1910–1911.) E. P. C.

SPECIAL METHOD. — See TEACHING, PRINCIPLES OF; METHOD, GENERAL AND SPECIAL.

SPECIAL SCHOOLS. — A term applied to schools organized for special classes of pupils or for instruction in subjects not commonly offered in the regular schools. Good examples of special schools are the day schools for the oral instruction of the deaf (see DEAF, EDUCATION OF THE), organized within the past ten to fifteen years by many American cities; the schools for the blind (see BLIND, EDUCATION OF THE), as maintained by Milwaukee and a few of the other larger American cities; the schools for crippled children (see CRIPPLED CHILDREN, EDUCATION OF), the hospital school for nervous and delicate children, as maintained in New York and Chicago; the schools for the instruction of retarded children (see BACKWARD CHILDREN; EXCEPTIONAL CHILDREN; and RETARDATION); and the schools for various degrees of mentally deficient children (see DEFECTIVES; SPECIAL CLASSES) recently organized in many American cities; schools for gifted children, as in Indianapolis, Worcester, and a few other American cities; schools for non-English-speaking children, as in Worcester and New York City; a school for stammerers and stutterers, as in Minneapolis; a school for "uneasy boys," as in East Orange, N. J.; and the open-air schools for anæmic and tuberculous children (see OPEN-AIR SCHOOLS; SUBNORMAL CHILDREN; SPECIAL CLASSES; TUBERCULOUS CHILDREN, EDUCATION OF), recently established in many places. The many state institutions for the care and training of the deaf and dumb, the blind, and the feeble-minded are also of this class. Many cities and some counties maintain special schools for the care and education of truants and incorrigibles, known generally as ungraded schools, truant schools (see Truant Schools), or parental schools, while the state industrial or reform schools are institutions for the care of incorrigibles and youthful offenders (see Reformatory Education). Still other types of special schools are the vacation schools (see Vacation Schools; Vacation Playgrounds), maintained in the summer by many American cities; the summer schools for children deficient in their work, such as those recently established in New York City and Cleveland; certain types of city night schools; nautical instruction schools, such as the one maintained by the city of New York (*q.v.*); the trade and industrial schools (see Industrial Education) now in process of establishment in many American cities; and the special agricultural schools (see Agricultural Education) now being established by a number of our American states. Sometimes special schools are provided for instruction in manual training, domestic science, and sewing, though generally these subjects are taught in the regular schools by special or by the regular teachers (see Special Teachers). The manual training high school (see Manual Training) may still be regarded as a somewhat special type of school, as may also the commercial high school (see Commercial Education). Still other examples of special schools are such schools as the Lowell and New Bedford (Massachusetts) Textile Schools, and the Rhode Island School of Design (see Industrial Education). A number of the larger corporations and industrial establishments also maintain special schools for their apprentices (*q.v.*), and a number of privately endowed trade and technical continuation schools exist in our American cities.

In Europe, the special school is a well-established educational institution, and in Germany such schools have perhaps reached their best development. The *Fortbildungsschule*, and the auxiliary schools for the education of defective and special classes, form a noteworthy feature of the German system of education. (See Germany, Education in.) The evening continuation schools of England are also noteworthy (see England, Education in), as are also the continuation schools of France (see France, Education in). E. P. C.

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SPECIAL TEACHERS. — A term applied to teachers who teach new or special subjects or classes, as distinguished from the regular subjects of instruction and the regular class teachers. Arithmetic and writing were once taught by special teachers, but are now generally handled by the regular elementary school teachers. In a few schools, special supervisors of these subjects are still employed. (See Supervisors and Inspectors.) Drawing and music are now in the process of passing from the care of the special to the regular teachers, with general supervisors employed in the cities merely to secure more efficient instruction. The normal schools have introduced these subjects, and they have been added to the examination subjects for certification, so that nearly all new teachers can now teach them. Manual training and domestic science are still in the special teacher stage, few regular class teachers being able to teach these subjects. The introduction of these subjects into the normal schools and the demand for their more general introduction into all kinds of schools will, in time, lead to their being taught in many places by the regular class teachers. Sewing is another special subject which is rapidly passing over to the regular class teacher, as is also agriculture.

The term is also applied to the teachers of distinctly special classes, or lines of work, intended to supplement or in part to supplant the work of the regular school. The special teachers of deaf children by the oral method, the teachers of classes of mentally defective children, and the teachers of classes of delinquent or incorrigible children are examples of this class of teachers. Teachers assigned to classes of tuberculous or crippled children, to parental homes or truant schools, and to schools for certain specialized forms of school instruction, such as nautical or trade schools (see Special Schools), are also special teachers. In a sense, all high school teachers are also special teachers. E. P. C.

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SPECIALIZATION. — See Colleges, American (section on Administration of the College Curriculum); Universities; the various articles mentioned under Professional Education.

SPECIFIC ENERGY OF NERVES. — See Nervous System.

SPECTACLES. — See Eye.

SPEECH DEFECTS. — **Types of Speech Defects.** — Excluding aphasia, defects of speech range from complete inability to make sounds (aphonia, *q.v.*) and mutism, through stammering, to incoherence, and result from a variety of functional and structural defects. Some of these are due to defects of the sensory apparatus, others to motor disturbances; some are paralytic, others ataxic. They are found in many nervous diseases, especially in vulvar paralysis, in paresis (dementia paralytica), in multiple sclerosis, in hemiplegia, and at times in chorea and other conditions in which the tongue or lips and the larynx are affected. Since speech is possible only because of the coöperation of a number of structures, it will be appreciated that deviations from the normal function of any one of these structures may produce anomalies or impediments in speech.

Aphonia, the inability to make sounds, is due to peripheral disorders (usually of the larynx) and may accompany functional diseases such as hysteria. Hoarseness is a relative aphonia, a lessened ability to make sounds, due to abnormal conditions of the larynx or throat. Mutism is commonly found in those in whom there is no defect of the parts concerned in the emission of sounds, but in whom there is deafness, usually congenital. Mutism is also found in dementia precox, and sometimes in hysteria, but in these conditions it is not an inability to speak, but only an unwillingness. Stammering, stuttering, lisping, and lalling are impediments rather than inabilities of speech. The four terms have various meanings, the more usual being as follows: stammering is a defective method of speech in which the sounds are uttered with hesitation, articulation being produced only after repeated attempts, the defect being due largely to inadequate or imperfect innervation of the various organs used in articulation; stuttering is a more marked defect in which the individual must make repeated efforts to articulate certain syllables or words, and in which there appears to be a spasm of certain muscles concerned in articulation; lisping is due to too great a length of tongue or to an inability to place the lips, the tongue, and the palate in proper relation with each other to produce the sound of "s"; instead of "s" the individual gives the sound of "th"; the term "lalling" is used for two different conditions, (*a*) the condition in which the sound of "l" is substituted for that of "r" and (*b*) that unintelligible kind of speech which is commonly found among idiots. It is common to call all forms of speech hesitation stammering, but many of the devices used (hem, haw, aa) are employed for gaining time.

It must be understood that nearly all forms of speech defects are symptoms of disorders which may range from those of the brain or of the ear to those of the mouth, of the larynx, and even of the muscles of respiration. The cause of each kind of defect must be understood before proper methods of treatment may be instituted, but for most purposes the indication of causes given above is sufficiently suggestive to enable the teacher to institute certain special methods of training the defectives with whom she deals.

The aphonias must be dealt with differently according to the causes of the condition. Disease of the larynx must be treated in a medical way. Mutism may be overcome by strong stimuli; in some cases of dementia precox and of hysteria where the patients have not spoken for several years they may be made to talk by appropriate methods of stimulation. At times it is necessary to treat these patients like children or like an aphasic and thoroughly reëducate them. The mutism due to deafness must be dealt with in an entirely different manner. (See Deaf, Education of.) Incoherence is not improved much by training, except that form in which the lack of orderly sequence is an aphasia (*i.e.* paraphasia). In the latter condition training is very beneficial.

On account of the imitative tendency of children, stammerers and stutterers should for reading lessons, etc., be isolated as far as possible from general classes, otherwise a whole class may develop similar tendencies or habits. The stammerer or stutterer, on the other hand, should be kept away from other stammerers and stutterers for a like reason; and he should associate with normally speaking children as much as possible, so that he may be affected beneficially by their manner of speech. Many of the defects may be improved by general breathing exercises and by the use of concomitant rhythmic movements. Music, especially singing, is of considerable benefit. S. I. F.

The School Problem. — The correction of serious speech defects presents a special problem comparable to that of the education of the various classes of defectives for which all progressive school systems now make provision. There is no doubt that the child that stutters or stammers badly is under as great a handicap in school and in social and business life as the blind, deaf, or crippled. The prevalence of serious speech defects is very much greater than is generally supposed. According to Gutzman and other authorities the proportion of stutterers in the school population of German cities is from one to two per cent. In France a similar rate was found among soldiers. As stuttering unfits a soldier for sentry duty, its correction is recognized as a problem in national defense.

The problem is not limited to any race or nationality or class of society. Among girls, however, the number of stutterers is far less than among boys. To the thousands of stutterers in our schools must be added the much greater number of stammerers or lispers — that is, children who omit sounds or substitute the wrong sounds. Dr. Scripture, from his extended clinical experience, estimates that the schools of the city of New York have 25,000 children who need special attention for speech defects.

As progress in school is largely conditioned upon ability to speak, deficiency in this respect is one of the important causes of retardation in school life — a cause which is cumulative in effect. Our school courses are based upon the assumption that children have learned to talk before school age, and, therefore, reading and writing are the primary subjects. A careful observation of children in the primary grades proves that very many habitually omit certain sounds or make incorrect substitutions. As these children learn to read, the words and letters of the book become firmly associated with the wrong sounds. Spelling lessons are useless unless we go back to the beginning and teach these pupils to talk.

Stuttering usually begins during school age and increases during the school period. It is by no means an indication of mental deficiency; indeed, the brightest children sometimes have this impediment. As, however, the stutterer is seldom called upon to read or speak in class, he loses interest, shows lack of attention, retains a limited vocabulary, and falls behind his class. Association with younger children, the ridicule of schoolmates, and the loss of grip tend to a lowering of self-respect. Frequently there occur crises of distress, anger, or defiance. Though without hope of employment, stutterers are apt to leave school at the earliest possible moment. With the correction of the defect in speech an entire change occurs. Indifference gives way to interest, intellectual progress is assured, social relations improve with the power of communication; but most noteworthy is the gain in self-control and will power. The boy who through weeks of laborious efforts has at last learned to rule his tongue knows that he is on the way to become master of himself.

In making special provision for defective speech, the leadership must be assigned to Germany, where hundreds of teachers have been trained by Dr. Gutzman of Berlin. Most European countries now have special schools or classes for correcting speech defects. In America a few cities, New York (since 1909), Chicago, Detroit, and Milwaukee, have adopted this feature in their public schools.

The correction of serious speech defects, however, is but a phase of a still larger problem, the general improvement of speech. So prevalent are harshness of voice, drawling in speaking, and nasality that Dr. Scripture suggests that all school children should be treated as incipient stutterers. In view of the practical value of the modern science of phonetics, the wisdom of such a procedure cannot be questioned. It remains for the schools to recognize the fundamental importance of correcting stuttering and stammering, of preventing such defects, and of improving the speech of all children, and to make general use of demonstrated principles.

The reasons for the almost universal neglect of the speech problem are not far to seek: (1) Baby talk and lisping are considered interesting in young children, and these imperfect habits are allowed to become fixed. (2) Where defects are recognized, it is generally assumed that they will be outgrown. (3) Most attempts at the correction of stuttering and stammering have been empiric, that is, they have no scientific foundation and involve no consistent training, and, consequently, result in failure.

Conditions of Training. — The correction of speech defects from the side of the school is primarily the substitution of right habits for wrong habits. As a preliminary to training, it is necessary to ascertain the causes of the imperfect habits and to secure the removal of these causes, so far as is possible, by the appropriate treatment, surgical, medical, or psychic. The origin of speech defects may be briefly summarized as due to: (1) disorder of development or imperfect acquirement of speech, owing to the extremely complex nature of the coördinations demanded; (2) malformations, as of the palate, teeth, or tongue; (3) nervous disorder; (4) mental or moral disturbance; (5) imitation. All serious cases should be examined by a specialist. Many large cities, notably New York, Berlin, Paris, and Vienna, have clinics for the examination and treatment of speech defects.

Methods of Training. — Instruction in classes is generally preferable to individual instruction, not only on grounds of economy, but on account of the mutual aid and confidence secured thereby. Various plans have been employed for the organization of such classes: (1) *The boarding school.* This has the advantage of an entire change of environment for the patient and readily permits the formation of new habits. It involves, however, danger of relapse, especially if reliance is placed upon accessory habits that produce an excess of self-consciousness upon a return to society. (2) *The day school.* Stutterers are sent for a term of ten or twelve weeks to a special school, as in Manchester, England, and at the end of the course return to their regular schools. (3) *Special classes after school hours.* This is the practice in German cities which have followed the plan of Gutzman. (4) *Special teachers* are utilized in the Chicago schools to visit various schools and give instruction to pupils suffering from speech defects. (5) *The New York plan.* A school is designated as a center for speech correction, to which a special teacher is assigned to conduct classes designated as speech improvement classes. Applicants for membership in these classes are registered in the school and assigned to their appropriate grades. Those who have serious defects are not called upon to recite until the class teacher is notified by the special teacher, to whom the stutterers report twice daily. The advantages of this plan are: (1) A favorable environment is formed. Pupils and teachers are sympathetic, helpful, and confident of success. (2) Pupils are not discouraged by fear of falling behind in regular studies. (3) All speech pupils are followed up even when not required to report to speech class. (4) Standards of speech are formed for the entire school, normal children are better trained, and incipient faults are corrected.

Corrective exercises may be classified under the following heads: (1) breath control, (2) rhythm, (3) voice, (4) articulation, (5) modulation. Though attention is generally paid to all these elements, the various systems may be distinguished according to the stress placed upon one or the other. Inhale easily through the half-open mouth, produce vowel sounds or phrases with no unnecessary loss of breath, learn to support the tone; break the exercises or speech into phrases, taking breath during the pauses; with the aid of the mirror, study the oral and tongue positions for each elementary sound until correct motor images are formed and associated; break up monotone by modulated exercises and expressive reading; have frequent conversation in order to provide for facility. To secure permanent results it is of the highest importance to gain the confidence and coöperation of the pupil; he must want to speak correctly, must know how, and must faithfully practice; he must be self-critical in order to recover in case of relapse.

The teacher should be exceptionally skilled and resourceful. She should be thoroughly trained in phonetics, and acute in detecting false positions.

Prevention of Speech Defects. — That prevention is better than cure is as true of faulty speech as of other bad habits. The chief condition promoting the evil is neglect. (1) In the home baby talk should not be encouraged. (2) In the kindergarten stress should be laid upon correct and complete enunciation. (3) In the school speech should come before reading, and the methods of teaching reading should be based on modern phonetics. When the child is permitted to read aloud it should be with the rhythm and modulation of natural speech.

The Speech of the Mentally Defective. — Naturally in this class of children speech, which is the most complex of all our motor reactions, is deficient or defective, and no other form of motor training is of more importance in attaining whatever degree of intelligence is possible. Children classed with the mentally defective on account of unintelligible speech have made normal progress after being trained to talk. The method of training is similar to that outlined above, but presented in slower stages and in connection with much training in rhythm and coördination. J. F. R.

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SPEECH, STANDARDS OF. — See English Usage.

SPELLING AND SPELLING REFORM.

— In any consideration of the proper principles of orthography we need always to bear in mind the fact that words were spoken long before they were written and that even now the real life of the language lies in the spoken word rather than in the written page. Writing is a means of recording that which has an independent existence of its own, although it might die in time, if it could not be set down. Of late the invention of the phonograph has provided us with a method of preserving speech quite independent of writing and likely to be increasingly useful. The object of writing is simply to give permanence to the spoken word and to extend the area of its influence. Certain forms of literature do not achieve their full purpose until they are translated from writing to speech: the drama is really alive only when we hear it from the mouth of the actor, and when it is illuminated for us by the art of the performer; and oratory is cold indeed when we read it with our eyes on the printed page instead of hearing it with our ears as it falls warmly from the lips of the speaker. Even poetry is to be said or sung rather than to be perused; we do not perceive the full power of a lyric until we say it aloud; its melody, its sound supporting its sense, — this is revealed to us only by our ears.

For centuries after man had achieved speech he had to rely on memory to preserve the records of his race. He came in time to use strung beads or knotted cords to aid him in recollecting and to help him transmit what he knew to successive generations. The earliest attempts at writing ignored words as words; they were pictographs such as our Indians still use, in which rude drawings set forth the essential facts that needed to be remembered or transmitted. They were a sign language by means of pictures. The forerunners of the alphabet were hieroglyphs, which were at first symbols for ideas rather than for words or sounds. After a long while man advanced from symbols for ideas to symbols for words. Then after another long interval he attained the use of symbols for the sounds of which the words were composed. At first he sought to find a single letter which should represent exactly a single sound. And this is the final function of spelling, — the use of letters to indicate the precise pronunciation of the word. It is the ideal of orthography that there shall be a single symbol for every sound and a single sound for every symbol, so that any one seeing a word for the first time could not help knowing how to pronounce it and that any one hearing it for the first time would know instantly how to spell it. Whenever and wherever in any language this orthographic ideal has been attained, spelling is self-explanatory; it is not something that has to be learned by hard labor; it is almost automatic; and such a thing as a spelling book is unknown and unnecessary. Unfortunately this ideal is rarely attained, and even when attained, it is ever in a state of unstable equilibrium, because the spelling of any word once accepted tends to become fixed, whereas the pronunciation may change from a variety of causes, thus slowly bringing about a divergence between the spelling and the pronunciation. The symbol which exactly represented a single sound may be forced in time to represent two or three or more.

Then an added inconsistency is introduced when words are borrowed from foreign tongues, since they sometimes bring with them the spelling they had in the language in which they were born, a language which has its own system of symbols satisfactory to itself but not likely to be identical with the system of the other language into which the new word is adopted; and the orthographic confusion is made worse when some of the imported words are allowed to retain their original symbols and others are respelt in accordance with native usage. For example, every modern language has taken over a host of words from the Greek containing the letter φ, which is the equivalent in sound of our *f*, but which is often represented by the *ph* it had in Latin. In English we find words derived from the same Greek root, spelt sometimes with *ph* and sometimes with *f*, *i.e. fancy*, *fantasy* (formerly written *phantasie*), and *phantom*. In Italian there is a logical uniformity, and *philosophy* appears as *filosofia* and *photography* as *fotografia*.

English has always extended an open hospitality to words from other languages. It has a double vocabulary, partly Teutonic and partly Romance. It is continually enriching itself from Latin and from Greek. It took over much of its marine vocabulary from the Dutch; and it has accepted terms dealing with the arts of war, of cookery, of millinery, and more lately of automobiling and aviation, from the French. The immigrants from all these foreign tongues often retain their original orthography, and we have in our books a host of spellings completely out of harmony with the original English system of orthography, *e.g. bureau, chaos, chaise, gneiss, xylophone*.

A further complexity was introduced into English some time ago by those who strove to bring the spelling of certain words into conformity with what they believed to be the derivation of these words. They rescued a perishing *u* in the archaic form *honour* because they held the English word to be directly derived from the French *honneur;* and they changed *controller* into *comptroller* and *iland* into *island*. These are all misleading etymologies; and the original English spelling was not only more accurate phonetically, but it represented better the real origin of the word. But even if these changes had been in accord with etymology, the principle which led to them was erroneous in itself. It is not the function of orthography to reveal the history of the word, even altho it may do this to the expert now and again. The sole duty of spelling is to represent the actual sound, no more and no less. These mistaken alterations, of which there are an immense number, often suggest an erroneous etymology; but even if they had been accurate, they would have been disadvantageous. The history of every word in our language is now recorded in the dictionaries; and there is no reason why any complicated spelling should be retained for the purpose of declaring the remote origin of the word. The Greek source of the Italian *filosofia* is as easily traced as the Greek source of the English *philosophy*. We cannot iterate too often that the best possible orthography is that which makes easy the task of spelling a word when it is heard and of pronouncing it when it is seen. Anything which interferes with this primary duty of orthography is intolerable. The letters of any language exist specifically to represent the sounds of that language.

As the result of the introduction of new words from foreign tongues and as a result of changes in pronunciation — like that which has recently brought about a divergent usage in the sound of the words *either* and *neither* — the orthography of no modern language is entirely satisfactory. The condition is best in Italian and in Spanish where rigorous reforms were accomplisht more than a century ago. The condition is worst in English, far worse than in French or in German. In France there has been an active movement to do away with certain of the most irritating anomalies; and in German certain minor reforms have actually been made, — the striking out of the silent *h* in *Thal* and *That*, for example. Both in France and in Germany the cry for relief has come first of all from the teachers of the young, who are in a position to know the enormous waste of time and of labor resulting from the complexities and from the inconsistencies of the accepted orthography. The appeal of the teachers has been heard by those scholars who have devoted themselves specially to the study of the language. In France, for instance, the leaders of the movement for orthographic reform are M. Brunot and M. Paul Meyer. The opposition has come chiefly from men of letters; ignorant of the needs of the teachers and ignorant of the history of the language, they have clung to the traditional spelling to which they are accustomed. They seem to feel that the orthography which they use is in some way sacred, and that to alter it, even to improve it by simplification, is to tamper with a holy inheritance. They are naturally conservative, and they are willing to let ill enough alone. It is to be noted, however, that many of the most distinguished authors, both in Great Britain and in the United States, have been strongly in favor of simplification.

In France there is an accepted standard of orthography having the sanction of authority. This is the famous dictionary of the French Academy. In English no such standard has ever been accepted; and there is not now nor has there ever been any uniformity in the orthography of thousands of words. Evidence of this can be found in almost any of our dictionaries, in the appendix containing the long list of words spelt in two or more ways. No two dictionaries, British or American, agree in all their orthographies. No man has any right to assert that the only way to spell the disputed words is the way he prefers. We have every one of us the privilege of choosing between *omelet* and *omelette*, *technique* and *technic*, *controller* and *comptroller*, *plow* and *plough*, *jail* and *gaol*, *rime* and *rhyme*, *catalog* and *catalogue*, *esthetic* and *æsthetic*, *honor* and *honour*, *manœuvre* and *maneuver*. Who shall decide, when dictionaries disagree? And of course a dictionary has no authority of its own. It is not a divinely inspired work; it represents only the desire of its editors to register what they believe to be the better usage. We are none of us bound to accept the decision of any dictionary maker, however much we may respect his scholarship and his judgment.

The most elaborate lexicographic enterprise in our language is the *New English Dictionary*, now being publisht by Sir James Murray and Dr. Henry Bradley and generally known as the Oxford dictionary. It aims to record the history of every word in the language with all the successive changes in orthography; and a glance at its pages shows that English spelling has never been settled or stable; it has always been elastic and fluctuating. And yet an examination of the Oxford dictionary discloses an encouraging tendency toward simplification by the casting out of needless letters and by an increasing conformity to normal forms. The Elizabethan *sette*, *batte*, *sunne*, and *dogge* have been cut down to *set*, *bat*, *sun*, and *dog*. *Musique* and *musicke* have become *music*. *Œconomicke* is now *economic* and *æra* is *era*. *Governour* has been shortened to *governor*. In the nineteenth century Macaulay spelt *phænomenon* and Parkman spelt *engulphed*, — which would seem very strange to us in the twentieth century, used as we are to *phenomenon* and *engulfed*.

But altho the Oxford dictionary provides us with endless examples of this tendency of the language to simplify itself slowly, it reveals also that the tendency works only sporadically, that it is very slow, and that it has not yet accomplisht all that it might. And to speak of a tendency working its own will is misleading, since it implies that the language is capable of improving itself. Of course it has no such faculty. Every modification of language is the result of human endeavor, conscious or unconscious. Every simplification of spelling has been due to the desire of one man or of several men to effect a specific improvement. The spelling of any language can be made what it ought to be only as the result of a determined effort to achieve the needed reform. It will not happen of its own accord or unless this effort is made. The improvement in the orthography of Italian and of Spanish was brought about only by resolute determination.

As the present condition of English spelling is recognized to be worse than that of any other modern language we need not wonder that there has been during the past century incessant agitation as to the best means of amending it. Indeed it was in the eighteenth century that Noah Webster publisht his essay "On the necessity, advantages, and practicability of reforming the mode of spelling and of rendering the orthography of words correspondent to the pronunciation." And when Webster issued the first edition of his great dictionary in 1828 he put into practice what he had preacht. Certain of the reforms he initiated were too radical to win wide acceptance; but it is due to him that we Americans now write *jail*, *almanac*, *wagon*, and *favor*, altho the British still cling to the less satisfactory *gaol*, *almanack*, *waggon*, and *favour*. Webster also advocated *theater* and *meter*; *theater* is the spelling more often found in the first folio of Shakspere; and why should we write *metre* when we accept *thermometer?*

There is no need to catalog the various phases of the incessant discussion during the early years of the nineteenth century. Landor, for example, advocated certain simplifications of his own. Tennyson insisted on writing *tho'* and *thro'* (for *through*) and on using *fixt* and *slipt*, *kist*, and *tost*. Professor Child of Harvard and Professors Hadley and Whitney of Yale were foremost in urging the need of concerted action. In 1874 Professor March, as president of the American Philological Association, proposed in his presidential address that the association should take active steps. A committee was appointed, which workt in concert with a similar committee appointed by the Philological Society of England; it made recommendations in detail, both as to the ultimate standard of phonetic notation and as to the particular steps of simplification which might be taken immediately. The two committees agreed upon a report and issued a list of several thousand simplifications. This list has been the basis of all recent agitation; but it failed to win favor, partly because it proposed too many changes at once and partly because it was unsupported by any organization having means to carry on an active propaganda.

This had been a move on the part of the linguistic scholars of the United States and Great Britain. The next important step was taken by the teachers of America who felt most keenly that the time had come to do something to relieve the children in their charge from our intolerable orthographic complexity. In 1898 the National Education Association accepted the report of a committee (of which W. T. Harris, United States Commissioner of Education, was a member) recommending the immediate adoption of twelve simplifications, *tho*, *altho*, *thoro*, *thoroly*, *thorofare*, *thru*, *thruout*, *catalog*, *prolog*, *decalog*, *demagog* and *pedagog*. These twelve simplifications were thereafter used in all the publications of the National Education Association and in many educational journals, including the *Educational Review*, edited by Nicholas Murray Butler of Columbia.

The widespread attention aroused by this action on the part of a body of teachers as numerous and as representative as the National Education Association was most encouraging. Many friends of the movement believed that the hour was ripe for a more vigorous campaign; and as a result the Simplified Spelling Board was organized early in 1906. It had among its members men of letters and men of affairs, scholars and teachers; the leading American universities were represented by their professors or by their presidents. The board desired to win sympathy for the cause also in Great Britain, and it elected to membership half a dozen of the foremost British scholars. It contained the editors of all the important dictionaries of the English language, the Century, the Standard, and Webster in America, the Oxford, the Etymological, and the Dialect in England. It was assured of the financial support of Mr. Andrew Carnegie, who had already done so much for the cause of education in both Great Britain and the United States.

The Simplified Spelling Board began its labors by issuing a list of three hundred words, already spelt in two or more ways, and by recommending the use of the simpler form. In this first list the board included the twelve words of the National Education Association; but it then proposed no simplification of its own. In subsequent lists, however, the board went further and advocated simpler forms such as had been recommended by the two philological societies thirty years earlier. Sometimes the board suggested the striking out of superfluous letters and sometimes it suggested the return to an earlier and better form, *fixt* and *kist*, for example, and *gost* for *ghost*; *gost*, it may be noted, was the more frequent spelling in Elizabethan English. It was careful to state that it did not propose any radical reform or any violent change, and that it desired to extend the existing rules and analogies of English spellings so as to get rid of needless exceptions and to produce a greater regularity.

As the Simplified Spelling Board was well supported financially, it was enabled to push its propaganda more effectively than any earlier organization. And its efforts were brought to the attention of thousands who might never have heard of them by the action of one of its members, then president of the United States. In the summer of 1906, Mr. Theodore Roosevelt directed the public printer to follow the recommendations of the Simplified Spelling Board in documents from the executive departments. Altho Congress failed to support the president, his action aroused worldwide interest and gave the movement a publicity which was very helpful. Nearly fifty thousand persons have adhered to the cause, and probably ten times as many favor it. The National Education Association has accepted the recommendations of the board; and so has the Modern Language Association of America. A host of weekly and monthly journals now use many of the simpler spellings urged by the board; and the shorter forms are appearing with increasing frequency in newspapers, especially in the advertizing columns. Many normal schools are teaching the briefer orthographies; and the attention of the general public has been directed to the subject as never before.

The first chairman of the board was Professor Brander Matthews of Columbia, but at the first annual meeting in 1907, Professor Lounsbury of Yale accepted the presidency and Professor Calvin Thomas of Columbia became chairman of the executive committee, Dr. C. P. G. Scott being the secretary. In 1908 a Simplified Spelling Society was organized in Great Britain with Professor Skeat as its president and Mr. William Archer as its secretary. Sir James Murray, Dr. Bradley, and Mr. Furnival were among the vice presidents; and Professor Gilbert Murray of Oxford is a member of its council. The Simplified Spelling Society and the Simplified Spelling Board are independent organizations working in accord for the same end. They are both animated by the desire of making our noble tongue fitter for its future service as a world-language, of lifting a heavy weight from the backs of our children, and of making English easier for the foreigners within our borders whom we are assimilating by countless thousands and also for the foreigners outside our borders, in our colonies or in other parts of the globe.

The simplified spelling movement now in progress is often confounded with radical phonetic reform, such as has been adopted in Spanish and in Italian. The difficulty of any radical phonetic reform is that we have in English departed very widely from the true theory that every sound should have a single symbol and that every symbol should have a single sound. The sound of *e* in *let*, for instance, is represented now by seven different letters or combinations of letters, in *let*, *head*, *heifer*, *leopard*, *says*, *said*, and *many;* to alter all the words in which these various symbols appear and to substitute one exact symbol for this sound would work a startling change in the appearance of an immense number of words. Furthermore, there are some forty sounds in our English speech and our alphabet has only twenty-six letters, — in fact, only twenty-three available, since *c*, *x*, and *q* have no independent utility. With our present alphabet there is no way of representing every one of the forty sounds by a single symbol, even if we could limit every existing letter to a single sound. New letters would be necessary, or modifications of existing letters, or digraphs or the introduction of diacritical marks like the umlaut of German or the cedilla of French or our English diæresis. A radical phonetic reform by the aid of these devices would be sweeping and it would be approximately final. It would be an immense boon to all who speak the language or who wish to acquire English. It has been advocated by ardent spirits as dissimilar as Max Müller and Mark Twain. But it has little chance of speedy acceptance, since the English-speaking race is not logical and since it has never been captivated by any thorogoing scheme of radical reform. In law, in politics, in life generally, the two nations who have English for their mother tongue have always revealed themselves as opportunists, content to take their reforms piecemeal, going forward tentatively and advancing very slowly.

What the Simplified Spelling Board is advocating is not a scheme of radical and immediate phonetic reform. It is working in the belief that no far-reaching and more or less complete reformation of English orthography upon a strictly scientific system has any chance of acceptance by the English-speaking people. Any such scheme would run contrary to too many linguistic traditions; it would have to overcome too many prejudices, and it would create too protracted a period of orthographic confusion. For the present at least it seems to stand outside the realm of practical politics. But the board believes that the present condition of our orthography is lamentable and that something needs to be done to better our spelling. It proposes, therefore, to work along the line of least resistance and to suggest first of all the casting out of the many parasite letters which perform no useful function; second, to return to simpler forms which have been superseded by later complexities; and thirdly to bring many anomalous spellings into accord with the more logical rules which govern the orthography of large classes of words. It is these three principles which have guided the Simplified Spelling Board in its successive lists. That it has been well advised in thus modestly seeking only for what has seemed immediately possible is proved by the popular support it has received. Its motto might be the saying of the great French critic, Sainte-Beuve, that "orthography is like society; we can never reform it altogether, but we can at least make it less vicious." The Simplified Spelling Board is merely trying to accelerate the movement toward greater exactness in the orthographic representation of the sounds of our language which has been at work slowly and more or less unconsciously ever since the users of English first paid any attention to their methods of spelling. It believes that it is not asking too much at once, and it is glad to get what it can, however little. And above all, it wants to force people to think about the subject, for it is certain that the result of investigation will be the conviction that something ought to be done, if our language is to preserve its vitality and to perform its full service.

Every simplification, however slight, will help to lift a burden from the shoulders of future generations. It will save the time of the child and the money of the parent; and, what is even more valuable, it will remove a stumbling block from the child's path, since every restored analogy will relieve him from reliance on his memory to the neglect of his reason. It will render English swifter of acquirement by the immigrant, and thereby it will help to fit the alien for citizenship. It will render English easier for the foreigner now perplext and repelled by the inconsistencies of the existing orthography. Whatever hastens the simplification of English spelling will aid in the wider acceptance of English as a world language; and it will, therefore, help to bring us nearer to a better international understanding and to peace on earth and good will toward men. B. M.

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The most important book is *English Spelling and Spelling Reform* by Professor T. R. Lounsbury, N. Y., Harpers, 1909. The lists and leaflets of the Simplified Spelling Board will be sent free on application to its secretary, 1 Madison Avenue, New York; among those most useful are: *A Letter to Teachers*, by Professor Calvin Thomas, and *The Need of Reform of Spelling in the Public Schools*, by Superintendent Maxwell. Also useful are *Simplification Simple de l'orthographie*, by Emile Faguet (Paris, 1907); *The Spelling Reform*, by Professor March, U. S. Bureau of Education, 1893, Circular of Information No. 8, and *The Problem of Spelling Reform*, by Professor W. W. Skeat, Proceedings of the British Academy, vol. 2, 1906. The most forcible and temperate statement of the case against any further simplification is "Orthography" by President B. I. Wheeler of the University of California, which appeared in the *Outlook*, vol. 84, Oct. 6, 1906 and was reprinted at Oxford and London as a pamphlet.

SPELLING BOARD. — See Spelling and Spelling Reform.

SPELLING, HYGIENE OF. — See Spelling, Psychology of.

SPELLING, PSYCHOLOGY OF. — From the psychological point of view, spelling is a sensorimotor habit, the sensory part of the process being the perception of the spoken or written word and the motor factor the activity of writing or pronouncing the letters of which the word is composed. It is clear that useful spelling is the former motor process rather than the latter, that is, spelling finds its chief useful application in writing. In spelling, as in other sensorimotor processes, the sensory cue to movement may be and usually is not the original sensory processes but imagery resulting therefrom. Spelling is like other such habits in one other respect, namely, that the images acting as stimuli to the movements may not be directly connected with the original sensory material. They may be, for example, motor images connected either with writing or with speaking the words. Spelling may thus be dependent upon visual, auditory, or muscular (hand and arm or vocal) images and since it is a well-known fact that individuals differ with respect to the degree of imagery it may be determined *a priori* that the habit of correct spelling may be most economically engendered in different individuals by different methods.

Spelling is, however, further complicated by the fact that reading is a habit which in part involves the same processes. Thus the phonetic method of teaching reading imparts a tendency to the use of phonetic analysis in spelling. A method of reading, on the other hand, which depends entirely on vision tends to encourage the use of visual factors in spelling. Furthermore, a method of teaching reading by teaching the child to recognize the visual forms of words as wholes is not likely to be of use in spelling, since it neglects the analysis of the word into its visual components, a process which is necessary for correct spelling. Indeed, it may be said that economical methods in spelling and reading are in some sense opposed to each other, since the one requires the analysis of the words both written and spoken into their component elements, while the other requires merely the recognition of the words as wholes.

While individual differences may be expected in the imagery most useful to various persons in spelling it appears from the experimental evidence that visual imagery is more useful than auditory. Lay's experiments with a large number of German school children and adults showed also that those methods which involve motor processes, as for example oral spelling with speech and writing movements, are superior to those involving no similar activities. Visual factors were shown to be much more effective than auditory, the most effective method being that of copying. Lay's results have been in general confirmed by other investigators. His conclusion, that the motor processes in and for themselves are effective, may not necessarily be valid, since in copying the learner must make a more careful and visual analysis than is likely to be made in any other case, and hence better results are to be expected. The advantage of visual methods over auditory, which was found to hold for nonsense words, is likely to prove all the greater in English where the sounds and letters are so ambiguous. Spelling by sound in English is proverbially impossible. At the same time it is undoubtedly true that much bad spelling is due to slovenly pronunciation, and cultivation of a correct pronunciation is a prime requisite for good spelling. Another advantageous method is the teaching of the derivation of words. Rules are also of some importance, especially in arousing the critical sense of the learner and fixing attention on the details to be learned.

Rice showed that much time is wasted in learning spelling and recommends fifteen minutes per day. Cornman showed by his results that special instruction has no better effect than incidental learning, the latter being not purely accidental, however, but dependent upon the following principles: (1) words likely to be misspelled were placed conspicuously before the pupils, (2) pupils were taught to consult the dictionary, (3) mistakes in written work were corrected. It may be added that where formal exercises in spelling are employed, the writing of connected sentences is more valuable than the spelling of detached words. Differences of opinion exist on the question of the advantage to be derived from simplified spelling in economizing labor in learning. It has been held by the advocates of the reform that the most monotonous part of the child's school work, especially drill in spelling, would vanish. On the other hand, it has been held by some that the reformed spelling would by its very uniformity take away that impulse for attention to the correct spellings incident to absence of regularity. E. H. C.

See SPELLING AND SPELLING REFORM; SPELLING, TEACHING OF.

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SPELLING, SIMPLIFIED. — See SPELLING AND SPELLING REFORM.

SPELLING, TEACHING OF. — Spelling is one of the original group of subjects taught in the elementary school. From the first it was associated with the three R's, reading, writing, and arithmetic, chiefly as a part of the training in reading which employed the alphabetic or spelling method of approximating pronunciation. With the nineteenth century it acquired status as an independent school subject. But the earlier association of spelling with reading influenced the content and the method of teaching spelling. Spelling still tends to derive its words from the reading lesson more than from any other subject, and many devices of instruction originating in reading have been transferred to spelling; *e.g.* diacritical markings, syllabification, phonograms, etc. The appearance of the early spelling books, really abbreviated dictionary lists, partly divorced spelling from reading, but to no important good result. Spelling vocabularies were then greatly extended; the chief methods of teaching employed (*e.g.* the spelling match) emphasized the difficult words, regardless of their importance in the child's written vocabulary. A reaction was inevitable. It first expressed itself in the movement to correlate spelling with the other subjects.

The correlationists, influenced by the teachings of the American Herbartians, argued that spelling was a subordinate subject or discipline, like penmanship, with no content of its own. In consequence, its materials were to be taken from the other subjects — geography, history, grammar, arithmetic, nature study, reading, etc. The more radical went so far as to say that since this was true, there should be no special spelling period, for all spellings required could be best taught incidentally, *i.e.* in connection with the subjects where the words originally occurred. This extreme subordination of spelling as a subject passed in its turn, and the spelling period was once more given a stated place in the school schedule, but under the control of a distinctly new set of ideals, methods, and conditions. The present view is that the materials utilized in the teaching of spelling should be intimately related to the child's need to use words in his written expressions. Written composition has supplanted reading as the chief source of spelling words, and words are taken from reading, geography, history, etc., only as these are likely to be used in written composition. This intimacy between the spelling of words and their use has made spelling methods less formal. A smaller vocabulary is taught, fewer words are mastered at a time, and larger account is taken of individual needs. The systematic study of words is given a relatively smaller time allotment. As a formal study, spelling does not appear in the primary grades until after a whole or a half of the first school year has passed; and in the grammar grades it may be eliminated with the close of the sixth year or given a very limited place, independent and incidental study by the pupil himself being relied upon.

The spirit of the instruction in spelling has changed vastly. Several decades ago the spelling period was devoted mainly to the testing of lessons which have previously been assigned for home study, and to the correcting of the errors discovered. The words were given and spelled in more or less arbitrary lists, motive for mastery being provided chiefly through competition for honors in the spelling match or monthly standings. Now spelling words are drawn from a context and spelled in a context — paragraph and sentence dictation sharing the spelling period with word lists. Even the word lists are based upon a careful classification which focuses attention on the meaning of words. A natural and vitalized method of teaching supersedes formal and artificial work; prevention of spelling errors is made more conspicuous than their correction; and teaching rather than testing is the dominant purpose of the spelling period. Under such a changed status, it is to be expected that present-day methods and devices for teaching spelling would be different from those that were traditional with the nineteenth century. Such is the case. The methods of the best current practice are more diversified and refined.

Theoretically, the words of first importance to a child are those he needs for his spontaneous written expressions. In practice, the school cannot make as fine adjustments as this statement would suggest. School teaching is a systematic matter; it must proceed by some plan which is the best possible anticipation of the needs of children. Hence the course of study and the textbook in spelling determine for the average teacher the words to be taught the child. The more recent books, based upon actual classroom experience and trial, have necessarily been better anticipations than those made at a scholar's desk remote from children who are learning. But even the best of these necessitate modifications and supplementary devices. The children of different localities and interests do not need the same words, or if they do they do not feel the need at the same time; again there are grade, class, and individual differences which must be taken into account. Many courses of study distinctly instruct the teacher to omit certain exercises in the spellers; and many request the teacher to use supplementary spelling lists; *i.e.* grade lists, class lists, and individual lists. These lists afford a more vital and efficient list of spelling words than the speller. The spelling book is an adjustment to conditions that are national, the grade lists to a particular school system, the class lists to specific classes, and the individual lists to particular children. A grade list is a list of words most frequently recurring in all the class lists of a particular grade. A class list is made up of the words common to the individual lists of a single class. The personal lists are kept in special blank books by the individual children. In his personal list the child is required to write (1) every word the teacher has spelled for him, (2) every one he has looked up in the dictionary, (3) every word marked incorrect in his exercises. Now and then the teacher tests the child on his personal list of spelling words, thus taking account of individual variations, as the text in a crude way takes account of common social needs.

When the most necessary words are assigned to a given lesson in spelling, it becomes the business of the teacher to give the child the power to know, in the case of each word: (1) the meaning it possesses, (2) the way it is to be pronounced, and (3) the conventionalized order in which the letters composing the word occur. And these three factors must be associated in the practical order in which they need to be recalled in a written composition. It happens in many cases, particularly with English-speaking children, that two of these factors are already acquired and associated. Thus we say that a given word is "within the experience and oral vocabulary of the child." In such a case, the teacher has only to drill the child in the written order of letters and to associate it with the already acquired meaning and pronunciation. Most traditional methods of teaching spelling through phonetics are based on the assumption that meaning and pronunciation are already acquired and that all the teacher has to do is to teach the pupil how to change the phonetic pronunciation into its appropriate letter structure. The assumption would be valid, save for two important facts: (1) the sound-form structure of the English language is far from being regular, and (2) the spelling vocabularies taught at school are very often outside the experience and speech of the children, especially foreign-born children. The conscientious teacher will always test the child's command of a word so that he may supply any missing factor or association which is basic to a successful phonetic method of teaching. If perchance the child is quite unfamiliar with the words, the teacher must do a great deal of work preliminary to giving the formal order of letters. He must begin at the foundation: (1) by developing the meaning of the word through active, objective, pictorial, or other experiences, and (2) by making certain that the proper pronunciation has been acquired in connection with these experiences. Then only may he pass to the memorization of the order of letters and its association with sound and meaning. To do otherwise is to make the work in spelling formal and artificial. Only by a special care that all three factors are completely associated within a given lesson can we make our instruction competent. By way of heeding this caution, the so-called method of "multiple association" has become prominent in the theory and practice of teaching spelling words. As each new word is presented it is impressed in every possible way. Meaning is given to the word through personal action and observation, discussion, the context of written sentences, and definition. The form of the spoken and written word is given through every channel of appreciation and reiterated through every expressive means: the ears hear, the voice mimics; the eyes see, the hand copies; the child experiences the theory, he reacts upon it through manipulation or dramatization. The acquisition has been guaranteed by richness of connotation and fullness of association.

Growth toward naturalism is clearly indicated by the growth in favor of the phonogrammic method over all other means of phonetic translation. The advantages claimed for the phonogram in teaching pronunciation and spelling are: (1) It provides larger units for the subdivision and recognition of new words, thus reducing the quantity of artificial handling of a word. This method may divide words of one syllable (r-un, fun; h-ide, side), but practically everywhere else it suggests larger sound units than the method of syllabification (dem-ocracy; aut-ocracy). (2) It provides the child with a flexible mode of attack that permits his individuality to express itself. Thus a young child might see "nationality" as "na-tion-al-ity" and an older one as "national-i-ty." (3) Irregular and complicated words may be treated as phonogrammic wholes, thus avoiding the most serious difficulties of phonetic letter translation (plough). (4) The phonogrammic method is least dependent for effectiveness upon artificial markings such as diacritics, accents, dashes of division, etc. In consequence the child learns to spell the word in the normal form. Each advantage claimed decreases some artificiality of previous practice.

Undoubtedly the better teaching of the meanings and pronunciations, basic to the spelling of words by their letters, has improved the efficiency of the teaching of this third factor. A perfect content insures interest and adequate motivation for spelling. Correct pronunciation eliminates errors, because spelling with many children is the sound of a word translated into its corresponding letter forms.

For the most part progress has been achieved in perfecting the teacher's ability to teach a child to know, pronounce, and spell words as presented to him. But the teacher's work is not complete until he has developed in the pupil the power to solve without assistance new spelling difficulties as he meets them outside the classroom. There are four special activities which are designed to give the child an independent power to deal with novel spelling difficulties. These are: (1) the use of the dictionary, (2) the application of word analysis and synthesis, (3) the application of rules for spelling, and (4) training the child to discover and correct the errors of his own vocabulary.

One important duty is to train children into the habit of consulting the dictionary in an efficient and ready manner. Once the child has left school, the dictionary must take the place of spelling book and teacher. It is his one competent resource. Use of the dictionary is generally begun in the fourth grade. The methods employed are so orderly and detailed as to be a sharp contrast to the careless methods previously employed: (1) The alphabet is reviewed to see that it is within the child's ready command. (2) The child is sent to the dictionary to find very simple known words bearing different initials, in order to establish the principle of alphabetization. (3) Then he is given other familiar words all bearing the same initials so as to establish the principle of subalphabetization. (4) Finally, words the spellings of which are doubtful to the child are given, and he is taught how to scan the pages economically so as to find them. (5) Special exercises are provided to show the pupil how the pronunciation (least, lest) or the meaning (capital, capitol) will help him to find a word whose spelling is in doubt.

Exercises in finding pronunciation are given in the same precise and systematic way until each needed step of technique is taught, — preferred pronunciations, the interpretation of diacritical marks through the key words at the bottom of the page, the use of accents, etc. In a similar manner he is trained to determine the meaning of the word as used. The abbreviations for parts of speech are taught. He reads all the meanings given, avoiding those marked "rare," "colloquial," or "obsolete," deciding on the most likely meaning with the aid of the examples of usage.

Word study, whether it be called word analysis or word synthesis, has, if sanely handled, a direct value in the teaching of spelling. To know something of the derivation and structure of words in terms of stems, prefixes, and suffixes is to have a convenient aid in approximating or suggesting the meanings, pronunciations, and spellings of words. In contemporary use word study is conducted in a distinctly inductive spirit. When the children know enough words with a common root or affix, the element is isolated through comparison, its sense established, the forms derived from it identified, and its further applications extended. The memorization of long authoritative lists of prefixes, stems, suffixes, derivatives, and definitions, which might or might not be applied to real words, has passed. The study of words is an exercise, not a discipline, and the word elements studied and the words analyzed are carefully selected with reference to the utility they have in the improvement of the teaching of spelling.

The same thing may be said with reference to learning and applying spelling rules. Only a very small number of spelling rules of greatest utility are now taught. These also are presented in the inductive spirit. When enough individual cases are mastered the generalization is induced by the child from his own knowledge. Frequently it is sufficient that the child sense the law, expressing it in any abbreviated way that aids his recognition of the cases to which it applies. Spelling rules are of little value in getting at anything but the letter spelling of words. They are of high value just where word analysis renders the slightest service, *i.e.* in giving the child independent power to determine the spelling of words in their changing forms (*e.g.* manly, manliness; lady, ladies).

The power of the child to grow by himself depends upon more than his ability to correct or verify the factors involved in spelling. That ability is a necessary middle stage which needs to be preceded by sensitiveness to differences of usage, and followed by ability to drill himself in the correct form. The teacher must develop the child's sensitiveness to clashes of usage in speech, written composition, or printed matter. If a child is made skeptical of his experiences every time he sees or hears a conflicting one, the basis of self-cultivation is laid. Appeal to authority will give him the correct form, which is then to be made a fixed personal habit through an interested repetition of the right form in connection with all its normal associates. Too frequently children are made sensitive enough to perceive their weaknesses and dutiful enough to appeal to the dictionary; but the power of self-drill is not made a part of the pupil's ability. H. S.

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SPELLING WHEEL. — See Alphabet Wheel.

SPENCER, HERBERT (1820–1903). — **Life and Writings.** — This eminent English philosopher was the son of George William Spencer, a teacher and the author of a work entitled *Inventional Geometry*. Herbert's uncles, and also his grandfather, were teachers. He was not taught to read until he was seven years old. At school he was an indifferent and even an idle pupil. He manifested little ability in memorizing and reciting material found in books, but found greater interest in things outside the schoolroom, and in real intelligence surpassed his fellows. Being unwilling to study the classics and prepare for Cambridge University, he withdrew from school in 1836, returning to his home, where, under his father's direction, he pursued his studies. The following year he served as substitute teacher for three months, his only actual experience in teaching. Becoming an assistant to a civil engineer, he spent much time in making surveys and drawings and in the study of mathematics, and was afterwards assistant to a railway engineer. It was while he was serving in this capacity that he invented the velocimeter. He furthermore gave considerable attention to the study of geology and reached the conclusion that Lyell's doctrine of the development of species was unsound. Here is to be found the genesis of his belief in the principle of evolution.

From 1841 to 1860 he spent two years at home in miscellaneous study, devoting other years to engineering, to making contributions to scientific journals, to serving as sub-editor of the *Economist*, and to the preparation of the volumes, *Social Statics* and *The Principles of Psychology*. It was during this period that he contributed to British magazines his four famous essays on *Education*. In 1860 he began the greatest of all his labors, the writing of his *Synthetic Philosophy*. This large undertaking, which, despite many interruptions caused by breakdowns in health, he lived to complete, consists of *First Principles*, one volume; *The Principles of Biology*, two volumes; *The Principles of Psychology*, two volumes; *The Principles of Sociology*, three volumes, and *The Principles of Ethics*, two volumes. Besides the volumes included in his *System of Synthetic Philosophy*, he wrote many articles for magazines, as well as three volumes entitled *Essays, Scientific, Political, and Speculative*.

In 1882 he visited the United States, where his philosophic writings had attracted great attention and had been received with great favor. In 1883 he was elected a member of the French Academy of Moral and Political Sciences, succeeding Ralph Waldo Emerson. From this time until his death he was engaged in completing his *Synthetic Philosophy*, in making contributions to various periodicals, in preparing the material for a detailed sketch of his life, and in other literary labors.

Spencer as a Philosopher. — Though many of his doctrines have been rejected as not satisfying the tests of philosophy, and though he established no school in which disciples could propagate his teachings, yet his influence upon the world of philosophic thought has, probably, been greater than that of any other man of his times. His great influence has been, and will be, of an indirect rather than of a direct character, for a high estimate cannot be placed upon his view of the world or upon his fundamental philosophical theories. Perhaps more than any other thinker of the nineteenth century he was influential in that he helped to systematize objective and subjective phenomena; in that he exhibited real genius for generalization, by which he sought to bind together phases of truth and of experience which had hitherto been studied in isolation; and in that he demonstrated and popularized the evolutionary, or genetic, method.

Contributions to Education. — In only one brief series of magazine articles does he directly attack educational problems. The volume containing them was published in 1861, the title of the four chapters being *What Knowledge is of most Worth; Intellectual Education; Moral Education;* and *Physical Education*.

Although these essays were written in controversial vein and though many of the contentions of their author will not bear critical examination, they have been exceedingly valuable in arousing schoolmen and parents throughout the English-speaking world to the necessity of educational reform. He fiercely condemns the traditional curriculum, and assigns to science the very highest value for both educational discipline and practical guidance. In spite of the flood of criticism called forth by his contentions, much of the criticism being entirely justifiable, Spencer deserves a place of honor because of his vigorous championship of scientific studies. In the three other essays he argues vigorously for reform in the theory and practice of the several phases of education. In place of ignorant neglect of physical training, he pleads for rational, scientific education of the body; instead of arbitrary and artificial means of moral development, he asks that natural and reasonable plans be adopted; and in place of the old-time principles of authority and pain in educating intellect, he advocates, at times with convincing eloquence, the doctrines of self-activity and interest.

Spencer's individualism in thinking, which was little tempered by his studies in sociology, prevented him from recognizing the worth of state education as a necessary means for the development of social intelligence, justice, and unity. He failed to realize that modern states, through wisely administered public school systems, are developing both individual strength and social solidarity. Overemphasizing the fundamental educational principle, that the sanctity of the individual human being should be kept inviolate, he undervalued the other great supplementary principle in education, that of social service, a principle which is opposed, not to individuality, but to individualism, and which conditions the spiritual progress of humanity. W. S. S.

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SPENER, PHILIP JACOB. — See Pietism.

SPENSER, EDMUND (? 1552–1599). — Author of the *Faerie Queene*, born in London, though probably descended from a Lancashire family. He was a pupil of Richard Mulcaster (*q.v.*), the first headmaster of Merchant Taylors' School (*q.v.*). In 1569 he went to Pembroke College, Cambridge (M.A. 1576), assisted by the family of the Nowells. Educationally Spenser is of importance as a man of culture in the sixteenth century, in modern as well as in classical languages. Closely connected with this aspect he holds in the history of English education, through his *Faerie Queene*, much the same position as Baldassare Castiglione (*q.v.*) held in Italian education, through his *Book of the Courtier* (translated by Hoby, 1561). For Spenser's work is specifically named *The Faerie Queene disposed into twelve books, fashioning XII Morall Vertues*, and in the introductory letter addressed to Sir Walter Raleigh, Knight, Spenser states that the "generall end" of the whole poem is to "fashion a gentleman or noble person in virtuous and gentle discipline." Prince Arthur, before he was king, is therefore chosen as the image of a brave knight, "perfected in the twelve private morall virtues, as Aristotle hath devised." Spenser only completed six books out of the twelve thus projected. But he also announces in the letter that he had in his mind the idea further "to frame the other part of politic vertues in his (*i.e.* Prince Arthur's) person after that he came to be King." The six books actually completed suggested the fashioning of the knight in holiness, temperance, chastity, friendship, justice, courtesy, and perhaps the cantos on *Mutability* may have been a first draft of a treatment on the larger scale of "constancy." In Spenser the medieval ages of chivalry become spiritualized into the highest qualities of manhood, and at the same time none of the concrete is lost, since the *Faerie Queene* is permeated with the poet's impressions of Sir Philip Sidney, Lord Grey of Wilton, and Sir Walter Raleigh, not to mention other Elizabethans in the background of his thought. The educational sources of Spenser are primarily Aristotle, medieval chivalry, Italian courtesy writers, especially Castiglione, and, curiously coloring all these elements, the serious elements of Calvinistic thought. F. W.

SPIESS, ADOLF (1810–1858). — Founder of modern German school gymnastics, born at Lauterbach, the son of a pastor who soon moved to Offenbach and there opened a private school. Young Spiess always showed an interest in gymnastics and physical exercises, taught the subjects in his father's school, and organized a *Turnverein* which took Jahn's *Deutsche Turnkunst* for its inspiration. In 1828 Spiess went to the University of Giessen to study theology, but his interest in gymnastics did not flag, and he spent a brief period in Berlin under Eiselen. In 1833 he was appointed to a school at Burgdorf, where he taught history, singing, and gymnastics. In 1844 he moved to Basel, where he developed, what became his chief contribution, a scheme of gymnastics for girls. Four years later he was appointed director of school gymnastics in Hesse and settled at Darmstadt. His influence in the development of the field was very great and was exercised not only by energetic personal activity but by his voluminous writings, of which the most important were the *Lehre der Turnkunst* in four volumes (1840–1846) and *Turnbuch für Schulen* in two volumes (1847–1851), a handbook for teachers of physical exercise.

See GYMNASTICS.

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SPINAL CORD. — See NERVOUS SYSTEM.

SPINAL CURVATURE. — This term is used in English to denote variations from the normal curvature of the spine. Three especial forms are distinguished, — lordosis, kyphosis, and scoliosis. Lordosis (from the Greek λόρδωσις, from λόρδος, bent forward) means a curvature of the spine forwards. Kyphosis (from the Greek κύφωσις, from κύφος, hunchback) means a curvature of the spine backwards. Scoliosis (from the Greek σκολιός, crooked) means a lateral curvature, and is the form which is most frequently met among school children, and for which the school is held especially responsible. Textbooks on school hygiene and the like usually class this as distinctly a school disease, traceable directly to unhygienic postures in the schoolroom. The argument is usually somewhat as follows: There are a relatively small number of cases of scoliosis. The number of cases increases greatly from the lower to the higher grades. The most common form of lateral curvature corresponds exactly to the temporary malposition most frequently found among school children in their work in reading and writing at the school desk, hence the disorder is distinctly and directly caused by the conditions of school life. Plausible and impressive as this argument is likely to be when supported by the old statistics of Eulenberg, Meyer, Krug, and others, recent investigations show that it is seriously fallacious.

The recent studies by Kirsch and others have shown that we cannot understand the causes of spinal curvature without going back and studying the conditions and diseases of infancy. Evidence is found that at least 15 per cent of the total number of cases are caused by innate peculiarities of structure and the like. At least 50 per cent are caused by rickets in the early years of infancy. Of the remaining 35 per cent, investigations by Scholder, Weith, and Combe indicate that if we study the different kinds of scoliosis separately instead of lumping them all together, as the older investigators were wont to do, we find that apparently only two forms of spinal curvature, namely, the total functional scoliosis so-called and lumbar scoliosi, increase from the lower to the higher grades; and these, if any, are the only forms that can be attributed directly to the evil influence of bad posture in the school.

While the evidence for the direct responsibility of the school in producing spinal curvature has been grossly exaggerated, the importance of maintaining a suitable posture in school work is by no means depreciated. A normal erect posture, where the body is firmly supported and the head and shoulders held erect, is vitally important for unhindered respiration, for normal circulation, and for maintaining the proper position and normal development of the internal organs. The ordinary malpositions, not only in sitting, but but also in standing, the stooped shoulders and slouching attitude, are liable to cause serious displacement of the viscera, especially of the transverse colon, and serious physical disorder results.

The treatment of spinal curvature must be by modern methods under the direction of a competent medical specialist. Remedial gymnastics without expert supervision is liable to do grave harm. For this reason some recent writers on this subject are extremely skeptical of the advisability of remedial gymnastics in the school.

The relation of spinal curvature to normal growth and development presents problems of grave significance. During the period of growth, especially during periods of accelerated rate of growth, the carrying of too heavy loads whether of schoolbooks or of anything else, even the weight of one's own body, is likely to produce spinal curvature; and most of the functional curvatures can probably be traced to this cause. The remedy is special care to protect children during the periods of maximum growth, especially at puberty, from any undue burdens, and to fortify the bony structure and the muscles by suitable nutrition, exercise, fresh air, and the like during the preceding periods of more moderate growth.

With modern scientific methods, with more extensive investigations, by the use of the X-ray, and the broader studies of infancy, the view in regard to the relation of the schools to spinal curvature has been radically changed, but the demands of hygiene are no less emphatic. Hygienic seats and desks that make a normal posture easy and natural, proper methods in reading and writing, physical exercise, proper periods of rest and recreation, protection from too heavy burdens, and above all intelligent methods of instruction and training, are all urgently necessary. This is one of the cases where the functions of the teacher and the hygienist cannot be separated, and where it is the duty of the school to develop a permanent habit of health. W. H. B.

See DESKS AND SEATS; POSTURE, RICKETS, and MEDICAL INSPECTION.

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SPINE. — See Spinal Curvature.

SPINOZA, BARUCH DE. — This famous Dutch philosopher was born in 1632, of Jewish parents resident in Amsterdam. After some early persecutions, the course of his life was quiet in the extreme. A slender income derived from grinding lenses satisfied his simple needs. Avoiding publicity of all kinds, he even declined the chair of philosophy at Heidelberg, lest his studies be interrupted and his freedom curtailed. In 1677 he died as he had lived, the exemplar of that tranquillity which his philosophy had taught.

Despite his retiring disposition, few, if any, in the history of thought have been so bitterly assailed as was Spinoza. The *Tractatus Theologico Politicus*, the only one of his works published in his life time, seemed to his critics to identify God with Nature and to deprive man of moral responsibility and the Bible of authority, so that not only during his life time but for a hundred years afterwards the very name of Spinoza was a synonym for all that was hateful to the religious world. Spinoza's works are few in number, comprising, in addition to the one just named, the *Ethics*, the *Tractate on the Emendation of the Intellect* (unfinished), the *Political Tractate* (unfinished), the *Short Treatise on God, Man, and his Welfare*, the *Principles of Descartes's Philosophy*, the *Cogitata Metaphysica*, and a half hundred collected letters. The *Ethics* is by far the most important, since in it is found the most detailed account of Spinoza's philosophy. Surely no worthy thought was ever couched in more forbidding form. The logical certainty which the age ascribed to geometry led the admirers of that science to value even the Euclidian form; so that we find Spinoza saying, by way of preface: "I shall consider human actions and appetites just as though I were dealing with lines, surfaces, or solids." And he did. We have postulates, axioms, propositions, corollaries, and scholia, — all the Euclidian paraphernalia applied to man and his emotions.

Spinoza's philosophy can best be appreciated by placing him in the scientific awakening which marks the seventeenth century. While Spinoza contributed nothing considerable to scientific knowledge and did not in his reasoning always remain clear of scholasticism, still no one of his century more thoroughly grasped the bearing of the logic of mechanical science upon such philosophical problems as teleology, contingency, and "free will." To Spinoza God was the one substance, hardly if at all to be distinguished from Nature; no anthropomorphism could be asserted of him. Physical causation was uniform and all inclusive. Purpose, time, and order were relative to man and his finiteness. It is because of this thoroughgoing scientific attitude that we find Spinoza appealing increasingly to the modern scientific mind. Spinoza sought to solve Descartes's problem of the interaction of mind and body by making thought and extension simply diverse attributes of the sole substance, — very nearly the modern doctrine of psychophysical parallelism.

The primary purpose of Spinoza, however, was not to elaborate a system of philosophy, but to seek an ethical theory which should lead men to a state of blessedness. A mere sketch of his theory must here suffice. Man is happy or unhappy according as he fixes his affection on the right or the wrong objects. If he loves things that pass away, he must be miserable. If he loves the truly permanent, he is never disappointed. The only finally permanent thing is God. To understand and so to accept the inevitableness of God's operations in Nature is to love him. From another point of view, no one who knows what a circle is, mourns that its radii are of equal length; so of any event, had we the insight we should see it as inevitable and as fitting as are the geometric properties of the circle. No disappointments or sorrow could come to one who saw things in their entirety. Adequate knowledge of God and of his operations in Nature must constitute, then, the path to human blessedness.

No specific effect on education can be traced to Spinoza unless it be in his influence on Schelling's mysticism, a doctrine which Spinoza would have been the first to reject. Along another line Spinoza's rejection of the (now) so-called "faculty" psychology might have afforded a basis for the modern development of that doctrine; but the historic connection seems improbable. Certainly no other first-rate thinker has affected education so slightly.

W. H. K.

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SPIRAL METHOD. — The study of a school subject by recurring topics is a spiral or concentric circle method. The thoroughness of each attack is determined by the needs or maturity of the child, each recurring treatment being more thorough, until the final study of the topic coincides with the logical view of the adult. This method, somewhat modified, is much used in the elementary school. The use of a purely spiral method was an American reform movement of the earliest years of this century. H. S.

See CONCENTRIC CIRCLE METHOD.

SPIRIT. — This term, like soul (*q.v.*), is very little used in psychological discussions. It refers, as does the term "soul," to a metaphysical entity which may or may not be attached to the body. Primitive mythology dealt very freely with this metaphysical entity and developed many statements with regard to its nature. Any study, therefore, of myths requires a clear recognition of the tendency on the part of every mind to treat natural phenomena under the general analogy of personal characteristics. C. H. J.

See PERSONIFICATION; SYMBOLISM, etc.

SPIRITUALISM. — The current use of the term applies to the theory of the occasional control by the spirits of the departed of the actions and revelations of mediums. Modern spiritualism dates from the manifestation occurring in the Fox family at Hydeville, N. Y., in 1848. Knockings and raps were heard and by the agreement that one rap should mean "no" and three raps "yes," the rapping spirit was led to reveal himself as a murdered peddler. (The raps were actually produced by the Fox children, by dislocating joints in the toes; this was confessed forty years later.) The belief in Spiritualism thus started rapidly spread; mediums appeared everywhere; new types of manifestations were added; the literature grew apace; the growth of the movement was most remarkable, and that despite early and frequent detection of mediums in fraud of the simplest and grossest type. Though extending to England and to all parts of the world, the movement continued to be mainly American. The annals of Spiritualism form an important chapter in the history of belief in the supernatural. The rapping led to table tilting and turning, the movements being due to the unconscious or involuntary efforts of the sitters under expectancy and excitement. The same basis of explanation applies to the spelling of messages by rapping at the correct letter as the finger moves rapidly over an alphabet (table talking). This equipment, together with signals for "yes" and "no," permitted a considerable variety of revelations among the early spiritualistic circles.

The development of the professional mediums introduced trance utterances and automatic writing; and volumes due to such sources abound in the early literature. Clairvoyance and other powers, such as the reading of sealed messages, — borrowed from the doings of "Mesmeric" somnambules (see MESMERISM), — were demonstrated; spirit faces and forms (materializations) appeared and were recognized, and their shadowy outlines in photographs were offered in evidence; the tying and untying of the medium in a cabinet, "slate writing," levitation of tables and of the medium, became standard performances in proof of spirit power. Along with the physical phenomena, the trance revelations persisted and were presented under varied and baffling circumstances.

Apart from the historical interest in spiritualism as a chapter in the psychology of belief, and its anthropological interest of affiliation with survivals of primitive and historical culture, the evidential character of the phenomena and their psychological explanation attract attention. To the spiritualistic hypothesis the physical phenomena and the trance or other revelations contribute quite differently. The logical alternatives of explanation differ and their evidential status is quite unlike. The physical phenomena must either be due to physical forces, — the manipulations dexterously concealed as intentional or unintentional fraud, — or they defy such explanation. In the latter case, their support of a spiritual agency is remote and slight. In addition it must be noted that hallucination, expectant attention, prepossession, and imaginative and uncritical reports would magnify relatively simple appearances into inexplicable marvels.

The revelational trance utterances rely upon the internal evidence of their content apparently inaccessible to ordinary channels of information. Kindred evidence has been in part offered in proof of telepathy (*q.v.*), and of psychical research. To appraise this evidence is most difficult and leads to an examination of the psychological motives of predilection for such belief, of the psychology of malobservation, prepossession, and the religious interest in a propagandum. The psychology of the trance state of the medium in terms of altered personality of an hysterical type enters into some aspects of the phenomena. Recent interest has been centered upon the evidential character of revelations under more rigid cross-examination. Spiritualism as a semireligious movement has declined; the persistence of interest is mainly due to the recent investigations both of physical and trance phenomena in the spirit of psychical research (*q.v.*). J. J.

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SPONTANEITY. — There is no evidence that nervous processes ever arise except through the reception into the nervous system of some sensory stimulation or through some circulatory or nutritive change in the internal condition of the organism, which serves to arouse the nervous tissue to action. Every contraction of the muscles depends upon motor impulses that are transmitted from the central nervous system. Bain discusses the matter at length in his volume *The Senses and the Intellect* (London, 1894), presenting an elaborate array of proofs for the presence of spontaneous activity. His arguments, however, grow out of a misconception of the nature of nervous activity, and the issue which he discusses is not of any importance in present-day psychology. At present all activity is traced to sensory impulses or internal organic changes.

In general educational discussions spontaneity is used not in the restricted sense above discussed, but to designate in a general way the ability of the individual to take the initiative in thought and action. There is evidence that the educational system tends to interfere with individual initiative. (See IMAGINATION.) Such interference is usually due to the fact that adults impose upon children adult standards of thought and behavior before the children are ready to conform to these more rigid adult standards. There is nothing in education which is inherently opposed to individual initiative, provided the educational process is carried on in such a way as to allow the full development of the individual powers at different stages of growth. C. H. J.

See INITIATIVE; INDIVIDUALITY; ACTIVITY.

SPORT, PSYCHOLOGY OF.—See ATHLETICS, EDUCATIONAL; PLAY.

SPORTS. — See ATHLETICS, EDUCATIONAL; GAMES.

SPRING HILL COLLEGE, SPRING HILL, ALA. — See JESUITS, EDUCATIONAL WORK OF.

SPRINGFIELD TESTS. — Several old sets of examination papers written in the fall of 1846 were found in the attic of the high school building in Springfield, Mass. These consisted of printed questions in arithmetic and geography, with the answers written on them, and written tests in penmanship and spelling. These questions with their answers were preserved. The tests were given to ninth-grade pupils in the Springfield school system in 1905–1906 and the results compared with the tests of 1846, the same person giving a rating to both old and new papers. The comparative results are as follows: —

	1846	1905–1906
Spelling — 20 words		
No. pupils examined	85	245
Ave. percentage of words correct .	40.6	51.2
Arithmetic — 8 examples		
No. pupils examined	79	245
Ave. percentage of answers correct	29.4	65.5
Geography — 12 questions		
No. pupils examined	81	219
Ave. percentage of answers correct	40.3	53.4

In ability to write, to spell, to reason and calculate in arithmetic, and in knowledge of locational geography, the children in 1905–1906 were superior to those taking the tests in 1846. A comparison of the conditions underlying instruction given in the year 1846 with that of 1905–1906 seems to indicate that the comparison of the answers of the two periods was a fair one. The publications of these tests and their results led to a widespread interest in them, and hundreds of school systems have applied these tests to their own instruction, with results favorable to modern methods of teaching. These proofs of the superiority of modern instruction in the traditional school subjects is important because there is a very prevalent opinion that the teaching of the "common branches" in the schools of to-day is inferior to that of a half century ago. They have had an appreciable effect in nullifying the arguments of the conservative critics who have hitherto, with some plausibility, maintained that the modern enriched course of study and methods of teaching are less effective than those of five decades ago. H. S.

See EXAMINATIONS; TESTS.

SPURZHEIM, JOHANN CHRISTOPH KASPAR (1776–1832). — German physician and phrenologist. He was born near Treves, and studied theology in that city from 1791 to 1795. In the latter year he went to Vienna, and there commenced the study of medicine in 1799. In the following year he met Gall (*q.v.*), and from that time until 1813 they were closely associated. They traveled in Switzerland, Germany, and Holland from 1804 to 1807, in which year they established themselves in Paris. Here they published together the *Anatomie et physiologie du système nerveux*, the *Recherche sur le système nerveux*, and several other works. In 1813 Gall and Spurzheim separated on account of differences in their theories, the latter spending the next four years in propagating phrenology (cranioscopy, as he called it) in England and Ireland. From 1817 to 1832 he again resided and lectured in Paris. In 1832 he came to America, where he died of typhus shortly after commencing his lectures in Boston. He was made Doctor of Medicine of Vienna in 1803, and of Paris in 1821, and was a member of many learned societies, including the Royal College of Physicians in London.

The phrenological conceptions of Gall were largely revised by Spurzheim, who renamed the "faculties" and redistributed them craniographically. Not only has Spurzheim's phrenological system remained the one most generally followed, but his writings and lectures did more to popularize phrenology than did the efforts of any other individual. His chief works, in addition to those written in collaboration with Gall, are: *Observations sur la phrénologie* (1810), *The Phrenological Sys-*

tems of Gall and Spurzheim (1815), *Essai philosophique sur la nature de l'homme* (1820), *Phrenology, or the Doctrine of the Mind* (1825), *The Anatomy of the Human Brain* (translated by R. Willis) (1826).

The application of the principles of phrenology to the general problems of education was made by Spurzheim in his *Views on the Elementary Principles of Education*, written in English and published at Edinburgh, 1821. The work passed through a number of English and American editions, and had a wide reading during the second quarter of the nineteenth century. In this book the author assumes the reader's acquaintance with the main statements of phrenology. Instead of presenting detailed procedures for the training of the several "faculties," Spurzheim conceives of education "as embracing every means which can be made to act upon the vegetative, affective, and intellectual constitution of man for the purpose of improving this his threefold nature." He opposes equally the *tabula rasa* theory (of Locke) and the initial equality theory of Rousseau. He emphasizes the educational importance of heredity, the differences in natural endowment, the need of proper nutrition and hygiene during infancy and youth, the effect of intellectual activity, and the difficulty of the moral direction of the faculties. He also discusses the education of the sexes, of nations, and (in an appendix) the function of legislation as effecting reforms and corrections of malefactors whom education cannot reach. K. D. and E. F. B.

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SQUARE ROOT. — See ROOTS.

SQUINTING (Strabism). — Squinting means, technically, that the lines of vision of the two eyes are not simultaneously directed towards that point of space which one means visually to fixate. This implies, therefore, that if one eye is normally fixating the point, *i.e.* its image falling on the fovea, the image will not fall on the fovea in the other or squinting eye, but on some peripheral portion of the retina. Double images, as a consequence, often arise; this is not always a sure criterion of strabism, however, since the eyes may adapt themselves so as to develop real binocular vision, the strabism still persisting. In the absence of double images and when the existence of a squint is not obvious, it may usually be discovered by having the subject fixate a given point and then covering and uncovering the eyes in rapid alternation; if one eye, at the moment of covering the other, turns towards the fixation point, one may be sure that it was not directed to it while the other was uncovered and is, therefore, the squinting eye. The usual forms of squint involve either an excessive convergence or an excessive divergence of one eye. Strabism is sometimes due to an actual paralysis of one or more eye muscles; more frequently, however, it arises when, for some reason, binocular vision is wholly absent, *e.g.* when one eye is quite strong and the other weak; in such case the necessity for coördinated convergence of the two eyes does not exist, so that the weak eye finally assumes a squint, *i.e.* the position most convenient for it. R. P. A.

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SQUIRE, EDUCATION OF THE. — See CHIVALRIC EDUCATION; GENTRY AND NOBLES, EDUCATION OF.

STAFF. — See MUSICAL NOTATION.

STAMMBUCH. — See COMMONPLACE BOOK.

STAMMERING. — See SPEECH DEFECTS.

STANBRIDGE, JOHN (1463–1510). — English schoolmaster and grammarian, born at Heyford, Northampton, and educated at Winchester College and New College, Oxford, where he became fellow in 1481. After serving as usher at St. Mary Magdalen School, Oxford, he was appointed headmaster in 1487 to succeed John Anwykyll, also a grammarian, and held that position for seven years. Robert Whyttington, who wrote some Latin Grammars, was a pupil of Stanbridge at Oxford. In 1501 he became master of the Hospital of St. John at Banbury. (See HOSPITAL SCHOOLS.) After 1507 he received several ecclesiastical preferments. Stanbridge wrote several Latin vocabularies and grammars which attained great popularity. Of these the *Vocabula* (later known also as the *Vocabularium Metricum*, *Embryon*, and *Embryon Relimatum*) was the most widely used. Beginning with words describing various parts of a man's body, the *Vocabula* goes on to give lists of words describing different functions and occupations. A feature of the book is that the Latin and English are given in different types, a feature employed by Stanbridge in other books. The *Vocabula* was an expansion of the *Vulgaria*, giving a list of Latin words and their English equivalents. The *Accidentia* is a catechism in English on Latin accidence giving also rules for Latin composition, later expanded under the title of *Parvulorum Institutio*, beginning "What is to be done when an Englysshe is gyuen to be made in latyn?" The teaching of grammar after the manner of Banbury School was prescribed for use in a number of schools, *e.g.* Manchester Grammar School, Cuckfield Grammar School, and Merchant Taylors' School.

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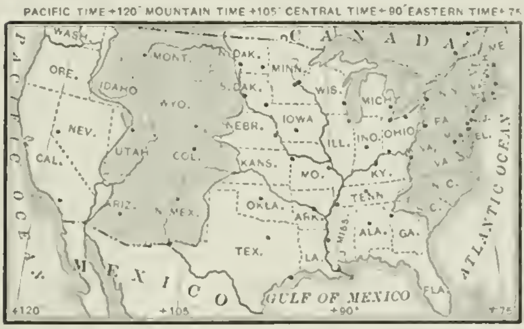
STANDARD TIME. — It is so much trouble to think of differences of time like 1 hr. 2 min. 17.5 sec., that most civilized countries have adopted a system of standard time. They have considered all places in one section as having the same longitude, usually some multiple of 15°, so that the differences in time from Greenwich (the prime meridian) shall be exact hours, and therefore all differences in time shall also be exact hours. For this reason New York (73° 58′ 25.5″ W.) is considered to have the longitude 75° W., and Chicago (87° 26′ 42″ W.) the longitude 90° W. Then when it is noon in England (which is all considered of longitude 0°) it is five hours earlier in New York, or 7 A.M., and it is 6 A.M. in Chicago. This map shows the standard time sections in the United States, the irregularities of the divisions being due to the position of railway termini nearly 7½° from the time meridians. When it is noon in New York it is 11 A.M. in the Central Time section, 10 A.M. in the Mountain Time section, and 9 A.M. in the Pacific Time section.



The standard time of Japan is that of 135° E. Australia has three belts, using 165° E., 150° E., and 135° E., respectively. Europe has three belts, the West European (0°), Mid-European (15° E.), and East European (30° E.), and other parts of the world have similar divisions.

As an educational topic standard time seems destined to replace the old treatment of longitude and time (*q.v.*). As such it has place in the elementary school, either in geography or in arithmetic. It may be introduced in the sixth, seventh, or eighth grade, being a topic of no difficulty. D. E. S.

STANDARDS IN EDUCATION. — See Course of Study, Theory of; Tests; Values, Educational; also Examinations.

STANDARDS OF SPEECH. — See English Usage.

STANFORD UNIVERSITY. — See Leland Stanford Jr. University.

STANHOPE, PHILIP DORMER. — See Chesterfield, Lord.

STANLEY, ARTHUR PENRHYN (1815–1881). — English divine, born at Alderly Rectory, the son of the Bishop of Norwich. He was educated at a private school and later at Rugby where he came under the influence of Arnold (*q.v.*), to whom he became bound by the strongest ties of affection. In 1833 he entered Balliol College, Oxford, and in 1838 was elected fellow of University College. In 1850 he was appointed secretary of the Oxford commission and in the following year became Canon of Canterbury. He returned to Oxford in 1856, where he was appointed professor of ecclesiastical history. In 1864 he was installed as dean of Westminster Abbey. Dean Stanley traveled widely and possessed great powers of description. He wrote much on ecclesiastical history (including *Lectures on the History of the Jewish Church*) and on questions of doctrine. His best known work, although his earliest, was the *Life and Correspondence of Dr. Arnold* (1844), which at once assured his position at Oxford.

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Dictionary of National Biography.
Prothero, R. E., and Bradley, G. G. *Life and Correspondence of Dean Stanley.* (London, 1893.)

STANLEY, HON. E. G. — See Parliamentary Commissions.

STAPULENSIS (1455–1536). — Jacobus Faber Stapulensis (Jacques le Fèvre d'Estaples) was born at Estaples, near Amiens, and died at Nérac. He was a priest, vicar of the Bishop of Meaux, lecturer on philosophy at the Collège Lemoine in Paris, and tutor to Charles, son of François I. He wrote on philosophy, theology, and mathematics. His *Epitome in duos libros Arithmeticos diui Seuerini Boetij* appeared at Paris in 1496. D. E. S.

STATE AID. — See Apportionment of School Funds; National Government and Education.

STATE AND CHILD. — Attendance, Compulsory; see Childhood, Legislation for the Conservation and Protection of;

Family Education; Parenthood, Education for; Pupils' Rights, Duties, and Obligations; State and Community.

STATE AND COMMUNITY. — For the aspect of this topic, which relates to requirements and reciprocal relations, see State School Administration; for that which treats of city relationships, see City School Administration, and for that which relates to the school as a social institution, see School as a Social Center, and Rural School Problem.

STATE AND EDUCATION. — See Citizenship, Education for; National Education.

STATE AND PRIVATE EDUCATION. — See Private Schools; Parochial School System; and State School Administration. The last article contains a statement of the relationship which the state should maintain toward all forms of extra-state educational efforts.

STATE BOARD OF EDUCATION. — This body exists in all but fourteen of the American states. It is more common in the east, south, and west than in other parts of the Union. Such boards are still in the process of evolution, so that they are very variable institutions, viewed from the standpoint either of their appointment or of their powers and duties.

History. — The first state to establish such a body was New York, the board of regents for that state having been created in 1784 as an advisory body to assist in the reorganization of Columbia (King's) College. This body has continued to the present, gradually receiving new powers, and in the reorganization of 1904 its powers and usefulness were still further increased. (See New York, State of.) In 1825 North Carolina created an *ex officio* state educational board, known as the "President and Directors of the Literary Fund," consisting of the state treasurer, the chief justice, and the speakers of the two houses of the legislature. In 1835 Missouri created a body with the name of state board of education. Massachusetts did the same in 1837, and Kentucky in 1838. Connecticut created a board of commissioners for common schools in 1839. Most of the Southern states created state boards of education after the Civil War, and nearly all of the Western states created a state board of education at the time of or shortly after the admission of the state to the Union. For the history of the state board of education and similar bodies in the different states, see the special articles on the different state school systems, as Alabama; Arizona, etc. See also Examiners, Boards of; School Fund Commissioners; and Textbook Commissions.

Types of State Boards. — In both personnel and method of appointment there is great variability. The earlier type of board was usually an *ex officio* body, composed of state officers. The governor, secretary of state, auditor, attorney-general, treasurer, and superintendent of public instruction, or some three or four of these officials, were commonly the *ex officio* members. This type of state board was created primarily to look after the school funds and the school lands, and it still persists in states where the state boards have been intrusted with but few educational functions. The early North Carolina board was of this type, and such boards exist to-day in North Carolina, Georgia, Florida, Mississippi, Kentucky, Missouri, Texas, Colorado, Idaho, and Oregon.

Another type of state board of education is the appointed or elected board. Where this type exists, the superintendent of public instruction is usually, and the governor is frequently, an *ex officio* member. In Michigan the state board consists of the superintendent of public instruction and three members elected by the people of the state at the general elections; in New York, of eleven members elected by the legislature, one each year, for eleven-year terms; in New Jersey, of eight members, appointed by the governor for eight-year terms; in Massachusetts, of nine members, appointed by the governor, for three-year terms; in Rhode Island, of the governor, the lieutenant governor, and five members elected by the legislature by counties; in Connecticut, of the governor, lieutenant governor, the secretary of the state board, and four others elected by the legislature, one from each Congressional district; in Maryland, of the superintendent of public education and six others appointed by the governor, with the principal of the normal school as an honorary member; in West Virginia, of the superintendent of free schools and five appointed by him; in Virginia, of the governor, attorney-general, superintendent, and three educators elected by the legislature; in South Carolina, Tennessee, and New Mexico of the governor, the superintendent, and seven in South Carolina, six in Tennessee, and five in New Mexico, appointed by the governor; in Louisiana and Montana, of the governor, the superintendent of public instruction, attorney-general, and seven members in Louisiana and nine in Montana, appointed by the governor; and in Washington, of the superintendent and four educators appointed by the governor.

Another type of state board is the *ex officio* educational body, though a few appointed members or state officials are not uncommonly added. In Indiana the state board of education consists of the governor, the superintendent of public instruction, the president of the state university, the president of the state agricultural and mechanical college, the principal of the state normal school, the superintendents of the city schools of the three largest cities of the state, and three educators appointed by the governor; in Nevada, of the governor, the superintendent of public instruction, and the president of the state university; in Utah, of the superintendent of public instruction, the president of the state university, the president of the state agricultural and mechanical college, and two educators appointed by the governor; in Arizona, of the governor, state treasurer, superintendent of public instruction, president of the state university, two normal school presidents, and two educators appointed by the governor; in Kansas, of the superintendent, the president of the state university, the president of the state agricultural college, the principal of the state normal school, and three educators appointed by the governor.

Fourteen states have no state board of education, though in six of the fourteen other boards, known as boards of examination, state high school boards, or state textbook commissions, exercise some of the functions exercised by state boards of education in other states. A number of states have two state boards, both of which exercise functions which in other states are given to a state board of education. The state board of education, the state textbook commission, and the state board of examination in Mississippi; the state board of education, the state textbook commission, and the state school fund commission in Kansas; the state board of education, the state board of land commissioners, and the state board of examination in Colorado; the state board of education, the state school land board, and the state board of higher curricula in Oregon; and the state board of examination, the state textbook commission, and the state high school board in Alabama, are examples of this.

Powers and Duties. — There is great variance in this respect among the different states of the Union. In some states, as for example Georgia, Kentucky, and Idaho, in all of which *ex officio* boards of education composed of state officials are to be found, the state boards possess little power and have but few duties assigned to them. In others, for example Louisiana, Indiana, New Jersey, and New York, the state boards of education are given large powers and exercise very important functions. In still others, for example Connecticut and Massachusetts, the state boards possess reasonably broad powers, and exercise still greater power by the publicity given to their actions and by means of their accurate and valuable annual reports. In Oklahoma and Montana we find the state boards not only possessing large and important powers, but also acting as boards of control for all of the educational institutions of the state. Not only do these boards control matters relating to the elementary and secondary school system of the state, such as are usually intrusted to state boards of education, but they also control the policy and management of the state university, the agricultural and mechanical college, the normal schools, and the other special educational institutions of the state. For a full and detailed statement of the powers and duties of the different state boards of education and of the other state boards possessing state supervisory functions, the reader is referred to the special state articles (ALABAMA; INDIANA; NEW JERSEY, etc.), describing the present school system in each of the American states. See also EXAMINERS, BOARDS OF; TEXTBOOK COMMISSIONS, and SCHOOL FUND COMMISSIONERS.

It is probable that the future will see a series of strong and influential bodies developed out of the present organizations. (See further STATE EDUCATIONAL ORGANIZATION; STATE SCHOOL ADMINISTRATION; STATE AND COMMUNITY.) E. P. C.

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Illinois Education Commission, *Bulletin* No. 1. *A Tentative Plan for a State Board of Education.* Tabulates conditions in all the states. (Springfield, Ill., 1908.) Also in the *Final Report of the Commission.* (1909.)

STATE BOARD OF LAND COMMISSIONERS. — See SCHOOL FUND COMMISSIONERS.

STATE BOARDS OF CONTROL. — See BOARDS OF CONTROL.

STATE BOARDS OF EXAMINERS. — See BOARDS OF EXAMINERS.

STATE EDUCATIONAL ORGANIZATION. — For a statement of the forms and types of state educational organization, now existing in the different states, the reader is referred to the articles on STATE SCHOOL ADMINISTRATION, and STATE BOARDS OF EDUCATION, and for a more detailed statement as to the forms found in each state, to the articles on the school systems of the different states, as ALABAMA, CONNECTICUT, etc. In this article a summary of recent tendencies and the outline of a good form of state educational organization will be given.

The tendency of legislation, and particularly of the recommendations of the many recent state educational commissions, has been clearly toward the creation of a state board of education, with some powers of supervision and control, and the assignment to this body of the appointment of its expert executive officers. The recent reorganizations in Massachusetts, New York, and New Jersey (*qq.v.*) represent the best thought and practice on this question. The state board of education should represent, primarily, the lay interests in public education; its members should be appointed for reasonably long terms; only a small fraction of the board should go out of office at any one time; and the board should not be composed of *ex officio* or state officials. There should be no essential difference between the state board of education in its appointment of executive officers and its control of educational organization throughout the state, and boards of education for such large cities as Boston, Chicago, Indianapolis, or St. Louis. Each should be responsible to the people, and each should carry out its work through the medium of carefully selected experts, appointed by and responsible to it.

The following plan for state educational organization seems to accord with the best educational theory: —

(1) There should be a state board of education, neither too large nor too small, composed of citizens of the state, and appointed by the governor, for reasonably long terms. A board of seven or nine is both small and large enough, and the terms should be arranged so that but one new appointment is to be made each year. Appointments should be based solely on an interest in the promotion of the public welfare and conspicuous ability to serve on such a board, and all such considerations as place of residence, political faith, race, or religion, should be entirely disregarded in making the appointments. There is little objection, and perhaps something to gain, if the appointments are submitted to the senate for approval. (2) The members of the board should be paid all necessary traveling expenses in attending meetings, but little or no salary. (3) One of the chief functions of this state board should be to select the state superintendent or commissioner of education, and in so doing they should be as free of residential and political restrictions as is a board of regents for a state university in choosing a president for the institution. The salary paid should be large enough to command the best men available, and should be at least comparable with that paid to the president of the state university. After a first period appointment, the term of office should be indefinite, with the possibility of removal by a two-thirds vote of the board, at the end of any school year. (4) The board should also appoint its own secretary and business manager, and assign to them their duties. (5) On the recommendation of the superintendent or commissioner of education, the board should appoint, for definite terms, all assistant superintendents or commissioners and all special agents or inspectors, provided for by law or by resolutions of the board. The head of each department should appoint and dismiss his own clerical assistants. (6) The state board of education should be primarily a body for the appropriation of funds, and for the creation or approval of educational policies the execution of policies once determined upon being intrusted to the executive officers of the board. (7) Through its executive officers the board should have general supervision and inspection of all forms of public education in the state, including the educational departments of all state charitable and reformatory institutions, and also the right of inspection of all forms of extra-state educational effort. (8) Through its executive officers, the board should provide for classification and standardization of all schools and colleges in the state, with power to take such action not contrary to law as may be necessary to promote the organization or the efficiency of the educational system of the state. To this end the conditions of admission to the normal schools and their courses of study; the certification of teachers; the accrediting of normal schools and colleges, within and without the state; and the interstate recognition of diplomas and certificates; the setting of standards, possibly in coöperation with the state board of health, for school buildings, sanitary appliances, and health supervision; the general enforcement of the school laws of the state; the enforcement of the use of uniform blanks for all records and reports, by both state and non-state schools; the apportionment of all school funds and the making of specific appropriations for special purposes, within the limits prescribed by law; and the making of an annual report to the governor, with power to suggest needed legislation to the legislature, should be among the powers and duties of a state board of education, acting always in conjunction with or on the advice of its executive officers. (9) On organization the state educational office in any of the more important states should include at least the following divisions, with division heads: (1) business and financial affairs; (2) administrative and statistical division; (3) secondary and higher education; (4) elementary education; (5) rural education; (6) vocational and industrial education; (7) education and training of teachers; (8) examination division; (9) legal division; (10) educational extension; (11) school and public libraries; (12) health and development; (13) attendance and child conservation.

For a more detailed statement of a desirable state educational policy, and the function of state educational organization, see article on STATE SCHOOL ADMINISTRATION.

In passing from the state to the county, in all states outside of New England and excepting only a very few states likely to be sparsely populated for a long time, as Nevada, where a state subdivision system may be best (see NEVADA, STATE OF), the nearer the system of county school organization and administration copies that found most effective by the cities, the better the county organization and administration of education will be. For this purpose, some form of the county system of administration (*q.v.*) will give the best results.

E. P. C.

STATE PUBLICATION OF SCHOOL BOOKS. — See TEXTBOOKS, FREE; also CALIFORNIA, STATE OF.

STATE SCHOOL ADMINISTRATION. — Education in the United States is essentially a state function. At the time of the formation of the Union, education was nowhere more than a local interest, and it was not for some decades afterward that it gradually evolved into an important state function. The history of this gradual development is traced, in some detail, in the articles on the COLONIAL PERIOD IN EDUCATION; CONSTITUTIONAL PROVISIONS RELATING TO EDUCATION, and in the historical portions of the articles on the different state school systems (ALABAMA, DELAWARE, PENNSYLVANIA; etc.), and to these the reader is referred for any historical statement.

To-day all of our states recognize public education, more or less consciously and fully, as an important function of the state, and all exercise over their subordinate units of government a more or less important guiding influence and control. Both the constitutions and the laws of the different states require the subordinate units of government to provide public schools; to assist them in doing so, certain forms of state aid are usually granted; and to see that they do so, certain educational officials have been created by the state. For purposes of educational administration, each state is subdivided into one or more forms of school units, for each of which one or more school officials are provided. Sometimes the organization radiates, essentially, from the top downward, as in the more strongly centralized states, while in others the school system seems to have been organized from the bottom upward, and decentralization is the rule. For a more detailed statement of the forms of substate organization, and the educational officials created, the reader is referred to STATE EDUCATIONAL ORGANIZATION; COUNTY SYSTEM OF ADMINISTRATION; COUNTY BOARDS OF EDUCATION; TOWN SYSTEM; TOWNSHIP SYSTEM; DISTRICT SYSTEM; SUPERINTENDENTS OF SCHOOLS; and the articles on the different state school systems.

The scope of the different state school systems naturally varies greatly. Some have a well-organized school system, in which kindergartens, elementary schools, high schools, vocational schools, vacation schools, schools for dependents and defectives, and normal and university instruction are all organized as part of the state's educational system, while in other states, the school system provided is as yet very meager. Naturally what the different states can and will provide for their children varies greatly, owing chiefly to differences in wealth, native stock, and educational advancement. It is not possible for the state of Mississippi, for example, to provide as good educational advantages for its children as can the state of Massachusetts, or the state of South Carolina to offer as good educational advantages as the state of South Dakota. The same is usually true of parts of the same state, such as the southern and northern portions of Illinois and Indiana, or the eastern and western portions of Massachusetts or Tennessee. With the state as the unit in education, these differences between the different states will persist for a long time, but within the same state they ought to be in large part eliminated by wise state legislation, and the carrying out of a wise constructive state policy.

State Educational Policies. — It is in the attempt to eliminate these differences and to unify the school system of any state that the need of a constructive educational policy is evident. In some states this seems to be almost lacking on the part of the state's educational authorities, and, so far as it exists at all, it is developed and carried forward rather by the leading teachers of the state. The political nature of the chief educational office and the constant rotation in that office almost preclude the possibility of a continuous educational policy. In but a very few states do we find evidences of any well-thought-out educational policy, carried out over any period of time. The conception of the state as an active energetic agent, working for the improvement of educational conditions throughout the state, is one that until within the past few years has been present in but a very few of our American states. Schools have too often been ordered by the state, and then each community has been left to do much as it pleased about the matter, almost the only penalties being a forfeiture of any state support if the minimum term was not maintained and if proper statistical reports were not made. As a result of such a *laissez faire* policy, the school systems created have been merely a loosely integrated collection of a large number of local and largely independent systems, instead of a state school system in any real sense of the term. Important administrative problems, with reference to the organization and scope of education, have been left to grow more aggravated instead of being remedied and improved, *e.g.* see the RURAL SCHOOL PROBLEM. The state oversight and control provided has been statistical and clerical rather than educational in its nature and purpose; and new legislation has partaken of the nature of patches on an old and often worn-out piece of machinery, in an effort to prolong its life, rather than of attempting to secure a new piece of machinery adapted to modern conditions and needs. The chief reasons for this lack of a constructive state educational policy have been that education is a comparatively recent state interest, with imperfectly developed conceptions in the minds of the people as to its need, purpose, and scope, and that the selection of those who were to direct the educational system has been left largely to politics, instead of being made an educational undertaking. (See SUPERINTENDENT OF SCHOOLS; POLITICS IN THE SCHOOLS.) One of the most hopeful signs of educational advance in the future is the recently awakened interest in the elimination of the state and county superintendency from politics, and the creation of boards of educational control whose functions shall include the creation, with their executive officers, of a state educational policy.

Special State Problems. — There are a number of distinctively state educational problems, some of which require careful study and often years of wise educational leadership before much in the line of visible results can be attained. To each of these, however, certain fundamental principles apply, and action taken in disregard of these fundamental principles is action which must later be revoked. These special state problems group themselves about the questions of finance, the extension of educational advantages, the provision of adequate professional supervision, the rural school problem, the material equipment of schools, health and sanitary control, the state and the teacher, the state and the child, the state and the community, and state and non-state educational agencies. While these problems have been discussed in detail in separate articles, a brief restatement is here desirable.

Financing the System. — This is, perhaps, the most fundamental problem of all in state school administration, and upon its proper solution all other possible advances depend. Some form or forms of general taxation, coupled with an intelligently worked out system for the apportionment of the proceeds, are absolutely essential to the proper maintenance of any state school system. Without some form of general taxation, we have only a series of local school systems, each paying its own way as best it can; and without a wise system for the apportionment of the proceeds of the taxation, with some reference to effort and need, the state is only a compulsory tax-gatherer. Schools are not, like sidewalks and streets, a matter of local interest, but a matter of grave state concern, and burdens borne for the advancement of the common interests of the state should be, in some large measure, equalized. Still more, the opportunities of education need equalizing as well as the burdens for support, and for both of these undertakings adequate finance and a wise system of distribution are absolute prerequisites. The fundamental educational principles underlying this problem are set forth elsewhere under the headings of TAXATION FOR EDUCATION; APPORTIONMENT OF SCHOOL FUNDS (*qq.v.*).

Extension of Educational Advantages. — The provision of an elementary school in each school district, free of tuition charges and for a minimum school term, is but the beginning of a state's educational system. Such advantages, while better than nothing, may be very meager, and compared with the educational advantages offered by a good city school system, may be very poor indeed. To provide advantages for all country children equivalent to those found in the cities may at first seem impossible, but as near an approach to this as can be had, should be made. Many steps are involved in the practical working out of such an educational conception, and many reforms will need to be inaugurated. Under the district system (*q.v.*) of school administration certain desirable advantages never can be provided, partly because the unit of organization is too small, and partly because of the difficulty of securing coöperative action between so many different school boards. Under either the town or township system (*q.v.*), or under the county system of school administration (*q.v.*), given adequate finance, the extension of educational advantages is very much easier. To extend the different educational advantages, so that good schools, a reasonably long term, a rich elementary course of instruction, high school advantages for all, and vocational instruction for such as need it will be within reach of all the children of the state, ought to be one of the goals of state school administration, and a state's educational policy ought to be shaped clearly in such a direction. (See also AGRICULTURAL EDUCATION; HIGH SCHOOLS; etc.)

Professional Supervision. — The provision of close, personal, and professional supervision for every school in the state ought also to be one of the goals of a state's educational administrative policy. In Massachusetts this has been attained, and in New York, New Jersey, Maryland, and a few other states a reasonably satisfactory condition exists. Generally, however, supervision exists, outside of the cities, largely in name, and is in no sense close, personal, or professional. One of the most important problems of state school administration to-day is that of reorganizing the county superintendency on a professional basis, and the provision of a sufficient number of professionally trained assistants to supervise adequately the schools of each county. (See SUPERINTENDENTS OF SCHOOLS; COUNTY SYSTEMS; RURAL SCHOOL SUPERVISION; and SUPERVISORY CERTIFICATES.)

The Rural School Problem. — This problem, or rather series of problems, is tied up closely with those of finance and professional supervision, previously mentioned. That the small rural school of to-day realizes but a small percentage of its efficiency is generally recognized, and much thought has been expended within recent years on the problem of its improvement.

That little can be accomplished, in most states, until there has been a radical reorganization of rural school administrative machinery, is gradually becoming evident. The problem is not local or even one of the county, but one that must be dealt with, in large part, by the state, as a part of a broad and comprehensive state educational policy directed toward the improvement of rural education. This topic is considered in articles on CONSOLIDATION OF SCHOOLS; RURAL SCHOOL PROBLEM; and RURAL SCHOOL SUPERVISION.

Equipment, Sanitary Control, and Health Supervision. — In a number of the American states a commendable effort has been made, within recent years, to see that the schools of the state are provided with proper teaching equipment, and that the school buildings are safe and sanitary. Laws requiring maps, charts, globes, and dictionaries have been enacted by a number of states, and some state aid for their purchase has not infrequently been given. (See SUPPLIES, SCHOOL.) Laws have also required school doors to swing outward, and buildings over two stories high to be provided with fire escapes. Separate water closets for the two sexes have been demanded; in a number of states the approval of all schoolhouse plans has been made a duty of the state or county superintendent, and in a few states some form of sanitary control has been begun. In a few others, the beginnings of health supervision for the pupils have also been made. On the other hand, there are many other states in which but little has been done as yet in this direction, and that little somewhat sporadically, and without conscious plan. See MEDICAL INSPECTION; SCHOOL HYGIENE; also ARCHITECTURE; HEATING OF SCHOOLHOUSES; VENTILATION, etc.

The State and the Teacher. — The interest of the state here is to secure the best teachers available, for the money which can be paid, for the schools of the whole state. The nature of the certification standards which can be set up and maintained is largely an economic question. The interest of the state, however, is to see that good standards are set and maintained by all of the subordinate units of the state, and the interests of the children rather than the interests of teachers should be the basis. As fast as standards can be increased and the schools still be supplied with teachers, low-standard local certificates should be eliminated. The certification system of a state should be planned as a unit, each step leading to a higher one, with larger standards, and with a life professional certificate as the goal.

Every state should carry out a conscious policy for the further education and training of teachers in service. The teachers' reading circle (*q.v.*), local and general teachers' institutes (*q.v.*), close personal supervision, and official reports as to teaching efficiency and personal growth should all enter as parts of a state policy for the further education and training of teachers in service. (See CERTIFICATION OF TEACHERS; INSTITUTES, TEACHERS'; PENSION SYSTEM; READING CIRCLES; TEACHERS, TRAINING OF; and TEACHERS IN SERVICE, IMPROVEMENT OF; TEACHERS, SALARIES OF.)

The State and the Child. — In addition to protecting the child from poor teaching, and in addition to securing for him a safe and hygienic school building and guarding his health, a wise state educational policy demands that he be given an education adapted to his needs, that he be required to partake of the educational advantages provided by taxation for him, and that he be protected from exploitation for commercial and immoral purposes. The enforcement of the compulsory attendance (*q.v.*), the child labor, and the child protection laws is, then, of fundamental importance, and the state should see that communities do their duty in the matter. This may involve the provision of free textbooks, shoes, and clothing, as well as free firewood and tuition; may involve the provision of special schools for special types of children; and may also involve the appointment of state agents to see that the local officials do their duty in the matter of the enforcement of the laws. The protection of the child morally and physically, and the advancement of the interests of the child, ought to form a prominent part in any state's educational policy. (See also ATTENDANCE, COMPULSORY; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; and CHILD LABOR.)

The State and the Community. — Under the American system of educational administration much is left to the community to determine and to put into force. The theory of American state school administration has been to leave large liberty and much power with the local units. When education was a small and not an especially important matter, this was much less objectionable than is now the case. Under present conditions too much liberty may mean weakness rather than strength.

There is a certain demarcation between the duties and powers of the state and the duties and powers of communities which ought to be observed in all state legislation and all state legislative control. In the kind or kinds of schools which must be provided, length of the school term, nature of the instruction, the certification of teachers, school supervision, sanitary standards, equipment, rates of taxation, minimum salaries, compulsion to attend, child protection laws, etc., it is primarily the business of the state to determine the minimum standards which will be permitted. It is also the business of the state to raise these minima, from time to time, as differing educational needs or conditions may require, and in so doing the state should always act on the basis of what is best for the children of the state, rather than on the basis of what the poorest communities can do or provide. This will frequently involve reciprocal obligations on the part of the state, and these the state, if actuated by a wise educational policy, will expect to meet. It ought also to be a distinct feature of a state's educational policy to stimulate communities to educational activity. To this end all money grants should be given in such a manner as to give the greatest stimulus to local action. (See Apportionment of School Funds.) The state ought not to act as a passive taxgatherer and interpreter of a uniform school law, leaving all initiative to local communities, as is so often the case to-day, but as an active, energetic agent, working for the improvement of educational conditions throughout the state. To this end every dollar of aid given should be in proportion to effort or need, and should be made either to secure an additional dollar by local activity, or be in response to urgent local needs and after a maximum local effort has been made. To collect taxes and hand out the proceeds indiscriminately, as is done by most of our states to-day (see Apportionment of School Funds, *School Population Basis*), is not wise state educational policy. In states having but a small income from the state permanent school fund, it might be very desirable if all general aid for elementary education were withdrawn, and the income from the school fund were used entirely to subsidize new and desirable educational undertakings and to aid poor and necessitous communities to meet the minimum standards of the state. (See also Special Grants; Subsidies.)

To give liberty to the communities of the state is desirable, so far as this can be done without interfering with the efficiency of the school system. Unnecessary uniformity in nonessentials, to which there is always a tendency as centralization of authority proceeds, is stifling to community activity. It ought equally to be a part of a wise state educational policy to find what can safely be left to local initiative, and to pass this down. The great progress which has been made in American education during the past half century has been due very largely to the freedom and initiative of individuals and individual communities. Unity in essentials, high minimum requirements for all, and much stimulation to additional community activity, together with much freedom for individual initiative in exceeding the required minima, in the choice of methods and tools, and in the extension of educational advantages, ought to be cardinal principles in a state's educational policy.

State and Nonstate Educational Agencies. — State schools were established for the preservation and the advancement of the state, and because it had been clearly demonstrated that the process of education could not longer be left with safety to private or religious enterprise. State education, however, is not exclusive. The coöperation of nonstate educational agencies is to be welcomed, especially if the education provided by such agencies is better and richer than that provided by the state. The one interest of the state is that all such education offered by private or religious enterprise shall not be poorer in quality or less in quantity than that provided by the state itself. To this end the state should provide for a system of friendly inspection of all nonstate schools, and none should be accepted for attendance, in compliance with the compulsory educational regulations, which are not as good as the schools provided by the state. Schools not taught in the English language; schools not complying with the building laws, or the sanitary or health-supervision regulations of the state; schools inadequately supplied with teaching equipment; schools taught by untrained and unfit teachers; schools not offering such instruction as will enable their pupils to pass into the state schools, and to find their place on our general educational ladder; schools failing or refusing to submit to inspection, or to coöperate with the compulsory educational authorities in the keeping of records and registers and the making of reports; and schools where the standards of instruction are materially below those maintained in the public schools of the community, — all such should be disapproved, and attendance at them disallowed during the compulsory education period. Similarly, institutions of higher learning should not be allowed to maintain low standards or offer cheap or poor instruction, and then be allowed to confer degrees under the authority of the state. All degree-conferring institutions in a state should be under the supervision of the state educational department, and those which cannot or will not meet the common standards for collegiate instruction should not be allowed to confer degrees or to call themselves what they manifestly are not. The general imposition of such standards and such inspection would not result in the closing of a single worthy institution of any rank, but would merely stop educational pretense and educational malpractice. In our tender solicitude for vested rights and liberty of instruction, we frequently forget that the interests of the children or of the students should be the measure of value. It would be unfortunate if the state were ever to take the attitude that its system of instruction is exclusive, and attempt to crush out all private or institutional effort, and there is no likelihood of such action ever being taken in the United States. It is the business of the state, however, to set and maintain minimum standards, and it would be foolish for the state to tax its citizens and compel its communities to meet the state standards, and then allow private enterprise to defeat its purpose. To this end some form of state oversight and approval for all private and institutional schools is a desirable exercise of the supervisory authority of the state. As for the private and denominational schools, if they are wise and engaged in an earnest effort at educating the children of their class or faith, they should welcome such inspection and approval, and be glad to coöperate in the enforcement of the state's educational laws. One of the best things which could happen for the private or the parochial schools would be that their teachers should be trained by the state and certificated by the state, and that their schools should be inspected, approved, and accredited by the state. (See also Parochial School System; and Private Schools.)

E. P. C.

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Many scattered articles have appeared recently in educational journals and the proceedings of educational associations relating to various phases of this subject. The bibliographies given at the end of the various articles to which cross reference is made bear more or less directly on state educational policy. The following are only a few of the more important recent books which are directly along the lines of this article.

Cubberley, E. P. *The Apportionment of School Funds.* (New York, 1906.)

The Certification of Teachers. Fifth Yearbook. Pt. II, Natl. Soc. Sci. Study of Educ. (Chicago, 1906.)

The Improvement of Rural Schools. (Boston, 1912.)

Draper, A. S. *American Education.* (Boston, 1909.)

Illinois Educ. Com. *Final Report.* (Springfield, Ill., 1909.)

N. E. A. *Report of the Committee of Twelve on Rural Schools*, 1897.

Report of the Committee on Rural Schools, 1913.

Ruediger, W. C. *Agencies for the Improvement of Teachers in Service.* U. S. Bur. Educ. *Bulletin*, No. 3, 1911. (Washington.)

STATE SCHOOL SUPERVISION. — See Supervision.

STATE TEACHERS' ASSOCIATIONS. — See Teachers' Voluntary Associations.

STATE TEXTBOOK COMMISSIONS. — See Textbook Commissions.

STATE UNIVERSITIES. — See University, American State.

STATIC SENSE. — Since 1870 evidence has been accumulating that a knowledge of the position of the body and of various movements of rotation and translation have their seat in the vestibular organs of the ear, the sacculus, utriculus, and semicircular canals. When these organs are destroyed by disease, or are injured experimentally in animals, ability to retain equilibrium and to appreciate position is impaired. It is assumed that the nerves are stimulated when the hairs which constitute the terminations of the nerves are disturbed by movements of the liquid of the vestibule or movement of the crystals that are found among the hairs. These excitations excite reflexes that adjust the body in the upright position, turn the eyes, etc. W. B. P.

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Mach, E. On Sensations of Orientation. *Monist*, Vol. VIII, 1897, pp. 79–96.

Myers, C. S. *Experimental Psychology.* (New York, 1909.)

STATISTICAL METHODS. — The ideal of science in the investigation of any field of phenomena is to reduce the laws to quantitative formulæ. Such exact statements make possible the most satisfactory predictions. It is presumed that cause and effect must vary together and in corresponding amounts. Until these relative amounts are ascertained the scientist feels that any causal relation is indefinite and uncertain. The physical sciences were naturally the first to attain this scientific ideal, and in consequence they boasted a superiority over the sciences of life, of mind, and of society. These were not exact and, many thought, could never hope to become so, for they held that the very nature of life and consciousness makes their phenomena unmeasurable. In recent years, however, quantitative methods have been applied with success in biology, psychology, economics, and sociology, and it is to be hoped that these subjects may ultimately enjoy at least a share of the exactitude of the physical sciences. One of the most important helps in gaining this result is the use of statistical methods. These have made possible not only far more accurate statement of complex facts, but also the detection and demonstration of relations that could not otherwise have been asserted.

In a general way statistics yield three classes of facts. These are collective facts, average facts, and facts of correlation. A collective fact is a summary of the number of cases of a given fact that occur within certain limits of space and time. The school population of a city at a given date, the cost of instruction in a school system for a year, the number of children who have left school during the year, etc., may be taken as illustrations. Collective facts are of the greatest importance in administration, for without them any accurately planned provision for large populations is impossible. Some sort of statistical information has long been gathered by educational authorities. It has, however, usually been of a very loose and inaccurate sort, good enough to make possible rough estimates of the school accommodations, school supplies, and teachers that it was necessary to provide, to determine the school budget and corresponding addition to the tax rate, and to permit the apportionment of general school funds among districts. The data were also incidentally used as a basis for comparison of the relative size of schools and school systems, the relative amount of expenditure, relative attendance, number of teachers, etc. Thus the general practice of using statistics to analyze school conditions became prevalent. This practice led to a demand for a far wider range of statistical information and for a far greater accuracy and uniformity in its collection. School statistics have, in the eyes of experts, been lamentably incorrect, and even when they were correct, of little significance. For example, it is impossible to compare the school attendance of a number of schools, if this has been collected under different conditions and at different dates, and estimated in different ways, including that of the mere guess. Again, the number of children who have left a school during the year is not useful as a means of determining how many drop out of school altogether, unless we know whether or not they have entered other schools.

The causes that tend to make prevailing school statistics so unreliable are the ambiguity of the questions sent out by school authorities, the inability to interpret them on the part of those who are to make out the reports, or their negligence and carelessness. Wherever the answers involve careful calculations, a tendency will appear either not to reply at all or to make a rough guess. It is plain that to make a statistical report of any value the questions asked must be unambiguous and capable of definite answers and the manner in which the reports are made out must be understood and taken account of. Again, where questions are intended to yield valuable information, it is usually necessary to have in mind beforehand the points to be settled by the facts discovered. Very much of the material so far gathered has been collected under the assumption that it might prove useful in some emergency not definitely foreseen. Unfortunately the event has often shown that it is of no such value. The feeling that this is likely to be the case renders both those who ask for reports and those who make them out indifferent to them and correspondingly careless and negligent.

The accurate establishment of collective facts by statistical investigations leads to the replacing of random guesswork in administrative matters by intelligent prevision. But the collective fact, although it covers a mass of details, is merely a particular, not an universal. The average fact offers more of this desired generality. Examples of it are the average increase in the school population, the average rate of elimination of pupils from a certain grade during a year, the average cost of education per pupil, etc. The knowledge of the collective fact of the school population for a year would enable provision merely for that year, but the additional knowledge of the average rate of increase would, it it were accurately determined, make possible every year a correct additional provision. Average facts may be fairly constant or decidedly variable. The death rate is an average fact, the degree of constancy of which gives the life insurance business a reasonably safe basis for its estimates. The significance of an average fact depends upon the number of cases and the range of their variability. In stating such facts, therefore, the average deviation (A. D.), the standard deviation (σ), and the probable error (P. E.) are of great importance. (See GRAPHIC CURVE.) The standard deviation is the square root of the average of the squares of the deviations of the individual measures from the average. If the deviations are fairly representative, the standard deviation calculated from a few cases will be much closer to the true average deviation of an enormous number than will the simple average deviation. The probable error is that deviation from the average within which half of the actual cases lie. Instead of the average, which may not correspond to the actual value of any individual case from which it is computed, many regard as more significant the median, which is the case above and below which 50 per cent of the cases lie, or the mode, the measure represented by the greatest number of cases. (See GRAPHIC CURVE.) The special character of the facts and the use to be made of them determines which of these values is most useful. It is evident that the average has the advantage that it is computed from all the cases, and thus in a way represents them all. At the same time, it is more affected by peculiar nontypical cases than is either the median or the mode. The average deviation, the standard deviation, and the probable error may all be computed from median or mode as well as from the average.

The use of statistical methods has aided very much in the introduction of measurement into the phenomena of mind, which have long been supposed to defy such quantitative treatment. The difficulty here arises from the fact that units of measurement are not readily to be found. In ordinary measurement the units are spatial. Many maintain that measurement refers primarily only to space or to that which has a spatial character. Mind is commonly supposed to have no such character. Hence objective measurement seems out of the question as applied to it. Subjective estimates refer to differences in degree, and it is noteworthy that the judgments of different observers or of the same observer at different times vary greatly. Here it is that statistical methods become of assistance, and it may be said that without them measurements of mental and social characteristics would have been well-nigh impossible. A good example of mental measurement under a minimum of difficulty is afforded by Weber's Law (see PSYCHOPHYSICS) which states the relation between the intensity of stimuli and the intensity of corresponding sensations. Evidently the intensity of the sensations has to be measured. In order to do this they are ranged in a series beginning with the faintest perceptible one and proceeding to the one just perceptibly more intense, and so on. It is found that the corresponding stimuli increase in geometrical progression. The natural assumption is that the sensations make up an arithmetical series. This implies that each member differs from the one above and the one below by one unit. It is doubtful, however, whether the mental difference between two successive sensations lower in the series would be regarded as equal to that between two higher therein. For example, the perceptions produced by the pressures of weights of 50 and 52 grams may be just perceptibly different. Then those produced by 200 and by 204 grams will be similarly different. But subjectively the second difference may, when once it is felt, seem greater than the first. Our units of difference are not certainly equal. Moreover, the same proportional increment of stimulus does not always produce the same effect on the intensity of sensation. Indeed, variability is here the rule.

Both difficulties may be helped by the use of statistical methods. First, the typical increase in the stimulus which will cause an increase in the intensity of the sensation may be determined by getting many estimates and ascertaining how they are distributed; *i.e.* what differing values of the increase of the stimulus they represent. Such a distribution is often represented by a curve of distribution. (See GRAPHIC CURVE.) Significant calculations in reference to it are the values which have already been mentioned; *i.e.* the average, the median, the mode, the average and standard deviations and the probable error. Similarly, it would be possible to range the just perceptible differences in a scale according to whether, as they appeared, they seemed smaller or larger than others. The range of distribution of the estimates of similar values must also be ascertained in order to have a result of any quantitative value.

When the range of distribution and the probable error of a number of estimates of the same value are known, it is evident that the value is determined in such a way that it can be used with a fair degree of scientific accuracy. We can say that the chances are even that any new estimate will not vary from the standard one more than the probable error. It is to be noted that in estimating certain values constant errors, like the astronomer's "personal equation" (see ERROR OF OBSERVATION), are apt to creep in. These affect the general reliability of the estimates of the individuals who are influenced by them. One man may tend to overestimate, another to underestimate, etc. If many observers take part, the constant errors of all may tend to neutralize each other. One must be on the lookout, however, for constant errors that are common to many, if not universal. These may sometimes be eliminated by practice. Sometimes they can be calculated and estimates corrected by deducing the known or probable constant error. Where constant errors are not calculated but corrected by ordinary judgment, the results are said to be weighted.

The measurement of mental traits is still more complicated. Here, however, the same methods apply. Measurement of any value may be obtained by placing it in a series of similar values. To standardize this series the estimates of many observers must be obtained and treated by statistical methods. (See PSYCHOPHYSICS; TESTS.)

It is evident that standardized tests afford a degree of accuracy in comparing the work done in different schools and by different individuals that has hitherto been entirely lacking. Teachers' marks are not an adequate criterion of the success of their work nor of that of the pupils they teach, except in so far as these marks correspond to standard achievement. The only method of arriving scientifically at such standard tests is by a consensus of opinion as calculated by statistical methods.

Individuals may be rated, though less accurately, by consensus of opinion without any definitely formulated standards. Professor Cattell has ranked men of genius by a calculation of the amount of attention devoted to them in different standard biographic dictionaries. The authorities of New York University have used a consensus of opinion among representative men in order to determine the memorials they should place in their Hall of Fame. Such estimates become reliable when their basis is understood, constant errors eliminated, and the probable error known.

The ranking of individuals of a class according to grades varies greatly with different teachers. Some give very few high marks and many failures. Some reverse this policy, while all degrees of intervening practice are to be found. It is evident that the significance of marks would be greatly increased by having a common method employed by all. Such an one is found in the plan of distributing the marks according to the curve of normal frequency. (See GRAPHIC CURVE.) If the grades are A, B, C, D, and E, we might expect, that in the average fair-sized class from 0 to 8 per cent would be graded A; from 15 to 21 per cent B; from 45 to 55 per cent C, and from 0 to 10 per cent E. If teachers were to try in a general way to conform their gradings to these proportions, the marks in various courses would be comparable and their significance correspondingly enhanced.

It is noteworthy that errors due to subjective variability are to be found in physical as well as mental measurements. The physicist or the astronomer must depend for his measurements upon the senses and upon instruments constructed and manipulated by imperfect human powers. It follows that different measurements of the same fact vary, and that the statistical method of gathering many estimates and calculating the probable error becomes necessary. Indeed, it was in connection with astronomical and physical measurements that these methods were first employed.

We have hitherto dealt with the measurement of mental facts in terms of a series. It is evident that all such results must be interpreted by reference to the series on which they are based. The fifth individual from the bottom of a series is not five times as good in the trait measured as is the one at the bottom. He simply represents the fifth recognized grade of ability, whereas the other person represents the lowest one.

We turn now from average facts to facts of correlation. Here we are concerned in the determination of causal relationships and laws in reference to mental and social facts. In this connection we find statistics indispensable. It is necessary to take the phenomena in a lump, since they cannot readily be brought under control so that the effect of single factors can be determined. In some cases they are so vast that an experimental reproduction of them is impossible; in others, so complicated that many disturbing factors cannot be detected and eliminated. In very many cases the conscious control involved in experiment so modifies the fact to be observed that the results are vitiated. Since experimental analysis of the factors is out of the question, we have the same difficulties that confront mental measurement; namely, that our facts are such that their exact character cannot be ascertained directly, but only through many calculations. For example, ability to learn quickly is a matter that could be tested only by many trials, since in many cases accidental conditions such as distraction of attention may cause it to vary. Similarly, to determine ability to remember, it will be necessary to have many tests. Now if a number of individuals are tested in both respects, the variations due to accidental causes will tend to be neutralized. The incidental conditions tending to cause one power to display itself at a relatively greater advantage than the other will be balanced by those that tend to throw the advantage in the opposite direction. The existence of a tendency of the two powers to vary together will then get a chance to display itself as a positive correlation, the extent of which will be an approximation to the amount of causal relationship involved.

The method of plotting the curve of correlation is discussed under *Graphic Curve*. The degree of correlation can be calculated. The formula generally in use is that developed by Professor Pearson. It is as follows:

$$r = \frac{\Sigma xy}{n \sigma_1 \sigma_2}.$$

Here r equals the coefficient of correlation; x equals the ability of an individual in one of the compared traits; y equals his ability in the other; Σxy, therefore, equals the sum of all the products of the two measurements of each individual. n equals the number of cases; σ^1 and σ^2 are the standard deviations of the measures of x and y respectively.

It is evident that the determination of correlation by statistical methods is similar in principle to induction by the method of concomitant variations as designated and described by John Stuart Mill. There is, however, this difference. According to Mill's methods all the significant conditions remain the same except the two facts, the concomitant variation of which shows them to be causally connected. But in working with mental and social facts we can rarely find the required continuity of conditions with variation only in correlated factors. We are, therefore, compelled to strive by elaborate statistical methods to neutralize the effect of all the varying conditions except those the relationship of which we are endeavoring to determine. The ability to do this puts the study of life, society, and mind on the plane of science that can claim at least a fair measure of exactitude. Thus by the use of the method of correlation Professor Pearson holds that he has demonstrated evolution by the natural selection of chance variations. E. N. H.

See Graphic Curve; Psychophysics; Mental Measurements; Reaction Experiments; Tests, Psychophysical; Records and Reports; Probability, Theory of.

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STATISTICS, EDUCATIONAL. — See Records and Reports; Statistical Method.

STATURE. — See Growth.

STEAM HEATING. — See Heating of School Buildings.

STEARNS, EBEN SPERRY (1819–1887). — University president. He received his education in the common schools of Massachusetts and at Harvard College. He taught in secondary schools in Massachusetts and Maine; was principal of the Framingham (Mass.) Normal School (1856–1869), Robinson Seminary, at Exeter, N.H. (1869–1875), and president of the University of Nashville (1875–1887). W. S. M.

STEARNS, WILLIAM AUGUSTUS (1805–1876). — President of Amherst College. He was educated at Phillips (Andover) Academy, at Harvard College (graduating in 1827), and at the Andover Theological Seminary. He was teacher at Duxbury, Mass., and was president of Amherst College from 1854 to 1876. Author of *Infant Church Membership* (1844) and numerous religious works. W. S. M.

STEELE, JOEL DORMAN (1836–1886). — Author of the "Fourteen Weeks in Science" series and many other schoolbooks; graduated from Syracuse University in 1858. He was principal of secondary schools in New York from 1858 to 1872. He published in 1867 *Fourteen Weeks in Chemistry*, and this was followed by similar textbooks in all the other sciences. He was also the author of a popular school history. He published altogether twenty-seven textbooks. W. S. M.

STENOGRAPHY. — See COMMERCIAL EDUCATION; SECRETARIAL PROFESSION, EDUCATION FOR.

STEPHANI, HEINRICH (1761–1850). — A German schoolman, born in Gmünd, near Würzburg. He received his early education from his father, a Protestant clergyman, and studied theology at the University of Erlangen. In 1784 he became a tutor to the two sons of the sovereign Countess Castell, in consequence of which he turned his attention to pedagogy. From 1791 to 1793 he stayed with one of his pupils at the University of Jena, studying law and coming into contact with Schiller. In 1795 he was charged with the direction of the ecclesiastical and educational affairs of the Castell dominions, and when these became merged in the kingdom of Bavaria, he was appointed school superintendent (Kreisschulrat) first at Augsburg and later (1811) at Ansbach. In this position he did much toward the improvement of the Bavarian schools, especially the elementary. He also issued a school journal, called the *Bavarian Schoolfriend*. He incurred hostility, however, on account of his extremely liberal religious views, so that he lost his position in 1817, and became pastor of the town of Gunzenhausen. In 1819 he was elected to the Bavarian legislature, where he fought for a betterment of the conditions of the elementary school teachers. Meanwhile his radical ideas on religion and church government caused constant friction with his ecclesiastical superiors. In 1830 he published a textbook for religious instruction which went so far as to deny all supernatural revelation. This finally resulted in his removal from office, in 1833, and the last sixteen years of his life were spent in retirement at Gorham in Silesia. In the history of methodology, Stephani is best remembered for his introduction of the phonic method of reading (*Lautiermethode*), which had been advocated as far back as the early part of the sixteenth century by Valentin Ickelsamer (*q.v.*), but which through Stephani's efforts first found general acceptance in the schools, displacing the old alphabetic method from which even Pestalozzi had not been able to free himself. The method is described in his *Kurzer Unterricht in der gründlichsten und leichtesten Methode, den Kindern das Lesen zu lehren* (*Brief instruction in the easiest and most thorough method of teaching reading to children*, 1803). This was followed, in 1814, by a more extended description of the method. The primers published by him on the basis of this method were in sole use in the Bavarian elementary schools until 1848. Other pedagogical works of his are: *Handbuch der Erziehungskunst* (*Handbook of the Art of Education*, 1835), and *Handbuch der Unterrichtskunst* (*Handbook of the Art of Instruction*, 1836). In these he put emphasis on the training of the will and on respect for the individuality of the pupil. In other respects, too, Stephani's educational views are surprisingly modern. He even advocated pupil self-government, which, as he said, he had practically tried in the school at Gunzenhausen. F. M.

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MARSCHALL, G. N. In Rein's *Enc. Handb. d. Päd.*, VIII, 862–881.

STEPS, FIVE FORMAL. — The principles of teaching when given concrete application assume a definite combination, emphasis, and sequence. Hence the various teaching processes tend to assume a definite form or structure. In common professional usage these typical teaching procedures or movements are called lessons. Pedagogical students have expended much effort in the attempt to analyze and state the characteristic forms and sequences involved in teaching. The most conspicuous and influential effort in this direction is found in the "five formal steps" formulated by the Herbartian thinkers. These stages or sequences have been largely derived from an analysis of the inductive mode of developmental instruction, on the assumption that this is the dominant mode in teaching, an assumption by no means accepted in contemporaneous theory. As usually given these steps are: (1) Preparation (of the pupil's mind for the activity planned), (2) Presentation (of the new knowledge), (3) Comparison (of the data) and abstraction (of the relations existing among the facts given), (4) Generalization (in the form of a judgment), and (5) Application (of the conclusion reached). (See RECITATION, METHOD OF.)

The "five formal steps" had their origin in Herbart's analysis of interest as a basis of mental activity. He maintained that there was a rhythmical alternation in the learning process between (1) Concentration, wherein concrete objects are presented, and (2) Reflection, wherein they are organized in terms of the existing systems of thought. Each of these phases of activity displays two aspects. Concentration upon the materials of knowledge gives them (*a*) "Clearness" or definiteness, and clear perception leads to their (*b*) "Association" with related factors in consciousness. Reflection then gives (*a*) "System" to them by referring them to generalizations, laws, or principles, to which they logically belong, and, thus finally organized, they are notions ready to be given application through some concrete (*b*) "Method" of use. Thus, the original formal steps of the teaching process suggested by Herbart were the four stages of (1) Clearness, (2) Association, (3) System, and (4) Method.

The original Herbartian steps have been variously modified and renamed by the followers of Herbart. The more generally used statement is that of the "five formal steps" as given above, Herbart's first step of "clearness" being subdivided into the two steps of "preparation" and "presentation" by Ziller, who maintained that arousal and organization of the old experiences to which the new facts are to be related is a stage which needs to be distinguished from the actual presentation. Rein prefaced these five steps by another, "the statement of the aim," wherein the problem was to be set in order to give direction and motive to the learning process. While accepting the amendment offered by Rein, the American Herbartians have usually subordinated it and given it a different placing, by making it a substep under the first stage of "preparation." Many teachers append a step at the end providing a definite "assignment" for the next lesson, the contention being that the next problem for study should be developed out of the previous thought or experience of the class and given such formulation as would make any outside preparation more effective. Other terms than those given above are sometimes used in stating the formal steps of the teaching process.

It is not contended that these topical sequences represent accurately the actual psychological processes involved; necessarily each step involves and overlaps the others, but the steps indicated represent the actual sequences of emphasized aspects. The pedagogical theorists have given a decreasingly important place to the formal steps in their theoretical discussions of the teaching problem as they have realized more fully the limited applicability of inductive development in teaching, and the wide variations of structure to be found in the many other types of teaching.

With the growing recognition that the "five formal steps" are not universally valid, there have been some efforts to modify them for other types of teaching, chiefly for the "deductive development lesson," where the five formal steps may be most easily modified to meet the case. The five formal steps modified for the purpose of inductive teaching are: (1) The statement of the problem demanding solution, (2) The gathering of the requisite data, (3) The recall of probably pertinent principles, (4) The inference of relation between the data and the appropriate principles, (5) The verification of the conclusion in terms of empirical evidence. There has been little success in adapting the formal steps elsewhere. The structures of other types of teaching have been worked out independently without much regard to the Herbartian system. The drill, review, examination, practice, and appreciation lessons are a few cases in point. H. S.

See Recitation, Method of; Teaching, Types of; Teaching, Principles of.

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STEREOSCOPE. — An instrument which depends upon the principle that when the two eyes look at a solid object, they receive slightly different impressions from this object.

With this instrument it is very easily possible to offer to experience various combinations of visual images giving to the two eyes now one combination of images, now another. The process of fusion can thus be studied very completely because of the experimental variations which can be introduced into visual experience. C. H. J.

See Psychological Laboratory, Equipment of.

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STETSON, WILLIAM WALLACE (1849–1910). — Was teacher of common schools in Maine; instructor in high schools and normal schools in Illinois; city superintendent of schools in Illinois and at Auburn, Me. He was state superintendent of public instruction in Maine, and active in the reform of the rural schools (*q.v.*). His publications include *History and Civil Government of Maine, Condition of the Rural Schools,* and many papers and reports on education. W. S. M.

STEVENS INSTITUTE OF TECHNOLOGY, HOBOKEN, N.J. — Founded in 1867 by Edwin Augustus Stevens. The institute was chartered in 1870 and its doors were opened for the admission of students in

September, 1871. The trustees named in the will of the founder selected Henry Morton, then professor of chemistry at the University of Pennsylvania, for president, and he served in this capacity until his death in 1902. His successor was Alex. C. Humphreys, M.E., Sc.D., LL.D., the present incumbent.

The endowment of the institution is now $875,000, and the value of its land and buildings about $1,000,000. Benefactions to increase the endowment and for the enlargement of the plant have been received from members of the founder's family, from trustees and alumni and their friends. The course, which is of four years' duration, aims to give the fundamentals underlying engineering science, and while the institution confers the single degree of mechanical engineer (M.E.), its students are educationally equipped and trained so that they can readily specialize in any branch of engineering after they graduate. The instruction is carried on through the following departments: chemistry, descriptive geometry and mechanical drawing, economics of engineering, electrical engineering, engineering practice, English and, logic, experimental engineering, mathematics, mechanics, mechanism and machine design, modern languages, physics, shop practice, and structural engineering. This instruction is supplemented by a course of lectures by practicing engineers. The requirements for admission are the full college requirements. The student enrollment for 1911–1912 was 361. There are 35 members in the instructing staff. Annual tuition fee is $225 and expenses per year for books, laboratory, shop and drawing room supplies, $60. A. C. H.

STEVENS, THADDEUS (1792–1868). — Statesman; studied at the University of Vermont and graduated from Dartmouth College in 1814. He was teacher in academies at York and Gettysburg, Pa., and took up the study of law. In 1833 he was elected a member of the legislature; and in 1835 it was largely through his efforts that the newly organized common school system was not abolished. W. S. M.

See Pennsylvania, State of.

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STEVIN. — See Fractions.

STEWART, DUGALD (1753–1828). — A distinguished member of the "Common Sense" school of Scottish philosophy, founded by Thomas Reid. He was the son of Matthew Stewart, who was professor of mathematics in the University of Edinburgh, where young Dugald, after attending the Edinburgh High School, continued his education, studying the classics, mathematics, and philosophy, and developing that literary taste so evident in his works. Later at Glasgow he became the pupil and disciple of Thomas Reid.

Stewart paid only casual attention in his writings to education. In speaking of association, he says: "It is the business of education not to counteract, in any instance, the established laws of our constitution, but to direct them to their proper purposes" (*Works*, Vol. II, p. 340). After observing that a wide knowledge of facts should precede a study of the mind, he continues: "Nothing can be more absurd on this, as well as on many other accounts, than the common practice which is followed in our universities of beginning a course of philosophical education with the study of logic" (*Works*, p. 421). Again, he takes occasion to refute the argument for necessity based by Hartley, Priestley, and others on the influence of education as described by Locke (*Works*, Vol. IV, p. 374).

Among Stewart's publications are: *Elements of the Philosophy of the Human Mind*, 1792 and after, in three volumes; *Outlines of Moral Philosophy*, 1793; memoirs of Adam Smith, Thomas Reid, and W. Robertson; *Philosophical Essays*, 1810; *General View of the Progress of Metaphysical, Ethical, and Political Philosophy*, 1816; *The Philosophy of the Active and Moral Powers*, 1828. H. H. H.

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STIGMA. — A malformation or sign of degeneration, either anatomical or physiological. Some of the anatomical stigmata of degeneration are: dwarfism and giantism, greater or less numbers of toes or fingers, cleft palate, etc. The physiological stigmata are probably dependent upon anatomical alterations, especially of the nervous system, which are not superficially apparent. These include lateness in walking, deafness, blindness, mutism, etc. For classification and details see references below. S. I. F.

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STILES, EZRA (1727–1795). — Eighth president of Yale College; graduated from Yale in 1746. He was tutor at Yale for eight years and president of the college from 1778 to 1795. He was interested in historical and scientific subjects and gave many popular lectures. His *Diary* has been edited by Franklin B. Dexter (1903). W. S. M.

See Yale University.

STILL LIFE. — See Art in the Schools.

STIMULUS AND RESPONSE. — These are conceptions introduced by the biological method of thinking. They correspond to the conceptions of cause and effect in physical matters and supplement the defects of that conception, in its traditional formulation, when applied to the phenomena of living beings. The older conception of cause and effect was that of a sequence of occurrences in which the consequent bears no relation of relevancy or adaptation to the antecedent. In the changes characteristic of living organisms the later event has a tendency to continue or to alter the earlier in a specific direction, so that the whole process is cumulative toward a given result — in general the sustaining of life. In this cumulative sequence, as distinct from the mere series of shifting alterations of non-living things, the earlier event functions as stimulus, the later as response. The two terms are thus strictly correlative, that which determines the character of a stimulus being the response which it evokes, while the response comes as an answer, so to speak, to the need of readaptation expressed by the stimulus.

Applied to the events of mental life, the conception of stimulus-response means that sensations are not the units or elements of knowledge, but are rather the occasions for adaptive adjustments to the environment. Movements, instead of being intruders from the physical region into the psychical or a sort of inexplicable physical annex to a psychical antecedent, are the resulting adaptive changes. The central brain processes corresponding to thought are explained upon the basis of this conception as the preparation for a new type of response, new, that is, in distinction from habitual responses which act through the medium of the cord and lower ganglia. As stimuli become more complicated, and as some of them, like those of eye and ear, have reference to conditions distant in space and hence indicate possible experiences remote in time, the immediate stimuli check one another's tendency to call out an immediate response, and a state of tension or suspense of overt action is brought about. Response is delayed until a new stimulus, representing more adequately the complexity of special stimuli, is elaborated. Upon this basis, thinking is always relative to action, namely, to the transformation of habitual activities into a mode of conduct adapted to a complex situation having novel features and remote implications.

J. D.

See Adaptation; Control; Function; Pragmatism.

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STIPEND FOR TEACHERS. — See Salaries, Teachers'.

STIRPICULTURE. — See Eugenics.

STOCKHOLM, UNIVERSITY OF, SWEDEN. — See Sweden, Education in.

STOCKWOOD, JOHN (*d.* 1610). — A leading English schoolmaster of Queen Elizabeth's reign; he took his degree at Heidelberg in Germany in 1567, where it is said he was in residence for eight years; and was incorporated M.A. at Oxford, 1675, and at Cambridge, 1579. He was headmaster of Tonbridge School, in Kent, from 1578 to 1585, and remained in that town as Vicar from 1585 till his death in 1610. There is a sermon (dated 1578) extant, in which Stockwood states the predominant position in educational studies which he attached to religious instruction, as against both profane classical writers on the one hand and Roman Catholics on the other, and would have children of papists compulsorily taught by "godly teachers" (*i.e.* Protestants) at the parents' expense. His school textbooks, which are of some value in tracing the development of class teaching in England (all published in London), are: (1) *A plaine and easie laying·open of the Meaning and understanding of the Rules of Construction in the English Accidence, appointed by authoritie to be taught in all Schooles of his Majesties Dominions* (1590). (2) *Quæstiones et Responsiones Grammaticales, ad faciliorem illarum regularum explanationem, quæ in Grammatica Liliana habentur, accommodatæ: quam unicam, et solam, Anglicanæ pubi in Scholis prælegendum, illustrissima Regina Elizabetha, auctoritate regia, statuit et mandavit* (1592). (3) *The Treatise of the Figures at the end of the Rules of Construction in the Latin Grammar construed with every Example applied and fitted to his Rule.* (4) *Progymnasma Scholasticum Hoc est, Epigrammatum Græcorum, ex Anthologia Selectorum ab He. Stephano* (1597). But the most important of his books was the *Disputatiuncularum Grammaticalium libellus, ad puerorum in Scholis trivialibus exacuenda ingenia primum excogitatus* (3d ed., 1607). This was the standard textbook for the collection of subjects of grammatical disputations in schools for the first half of the seventeenth century and received the favorable criticism of both Brinsley (1612) and Hoole (1660). F. W.

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STODDARD, JOHN FAIR (1825–1873). — Teacher and author of textbooks; was educated in the district schools and private academies of New York, graduating from the State Normal School at Albany in 1847. For two years he taught in the district schools, and for sixteen years he conducted private normal schools in Susquehanna, Lancaster, and Wayne counties, Pa. He was principal of a public school in New York City from 1859 to 1864. He was the author of a series of mental arithmetics and of other school mathematical textbooks. W. S. M.

STOICS. — A school of philosophy based on the teachings of Socrates and thence known as one of the Socratic schools. It was founded in the third century B.C. by Zeno, a native of Cyprus, who with his successors — notably Cleanthes and Chrysippus — taught in a porch in Athens adorned by Polygnotus, the Stoa Poikile (painted porch) whence the school desired its name. Stoicism was really a modified form of Cynicism. It rests on the same fundamental doctrine that happiness is to be found only in virtue and that virtue itself is a willing and conscious conformity with nature. The defect of Cynicism lay in its crude interpretation of "nature," in its irrational repudiation of all convention as being contrary to nature, and in its consequent assumption that all forms and conventions were unnatural and therefore obstacles to a happy and virtuous life. The Stoics, more in tune with the spirit of Socrates, Plato, and Aristotle, regarded nature not as an unmeaning complex of forces, a turbulent current to which it is our happiness and duty to yield, but as essentially reasonable. Nature, said Seneca, is God, the supreme Reason. Conformity with nature meant to the Stoic conformity with reason and law, convention and pleasure alike being bad only when unreasonable and lawless. "Keep the straight course, following your own nature and the nature of the universe; and the way of both is one." "Live with the gods. And he lives with the gods who ever presents to them his soul acceptant of their dispensations and busy about the will of God, even that particle of Zeus which Zeus gives to every man for his controller and governor — to wit, his mind and reason." (M. Aurelius, IV, 27; V, 27.)

In the hands of Zeno and his successors, especially as interpreted by Seneca (*q.v.*), Epictetus (*q.v.*), and Marcus Aurelius Antoninus (*q.v.*), Stoicism became the noblest example of the practical philosophy, philosophy as teaching how one may live the best life, that supplanted the highly speculative philosophy of Plato and Aristotle. In this regard, as in many of its most distinctive tenets, it represents a reversion to the teaching of Socrates. The doctrine that no man willfully misses truth, the emphasis on the supremacy and sufficiency of the moral will, the belief in the unimportance of external, nonmoral goods and the consequent necessity of cultivating indifference to these, are essentially Socratic. Equally important and closely involved in the all-importance of reason and the moral will was the doctrine of human brotherhood, — "Man's brotherhood with all mankind, not by blood or physical descent, but by community in mind." C. F. L.

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STONE, ADMIRAL PASCHAL (1820–1902). — School superintendent; educated at Vermont academies and Dartmouth College. He was teacher and high school principal in Massachusetts, and from 1873 to 1888, superintendent of schools at Springfield, Mass. For several years he edited the *Massachusetts Teacher* and served as a member of the state board of education of Massachusetts. He was active in the American Institute of Instruction and the Massachusetts Teachers' Association. He was the author of a school *History of England,* and many papers on educational subjects. W. S. M.

STONYHURST COLLEGE, BLACKBURN, ENGLAND. — The oldest and best-known Catholic public school in England, conducted by the Jesuits. Its history goes back to the days of the penal laws against dissenters in the days of Elizabeth, when many Catholics were compelled to find an education abroad. A school was founded by Fr. Robert Persons at St. Omers in Artois in 1592 and here continued until 1762, when the Society of Jesus was expelled from France by the Parliament of Paris. The whole school migrated to Bruges, where it remained until the suppression of the Society in 1773. Many of the Fathers and pupils found a home at Liège until the approach of the revolutionary army in 1791 compelled the school to find a new home. It was decided to return to England, where Thomas Weld, an old pupil and later a Cardinal, handed over to the Society his residence and estate at Stonyhurst, Lancashire. Here the school was reopened and met with success. A period of building activity, from 1877 to 1889, provided the school with excellent equipment and accommodations. The college was gradually developed along English public school lines. The enrollment is about 350 annually, and the college is divided into Preparatory, "Lower Line" and "Higher

Line" (traditional divisions) and "Philosophers." The classes or forms bear the names traditional in Jesuit schools, *e.g.* elements, figures, rudiments, grammar, syntax, poetry, rhetoric. In addition there are higher courses beyond the usual curriculum of an English secondary school, giving English philosophy, political economy, and political science, Roman and English law, sciences, mathematics, languages, and a first-year medical course. Preparation is given for the examination for the B.A. of London University. The college possesses a valuable library of 40,000 volumes and a number of illuminated Mss., black-letter books, and Incunabula. St. Mary's Hall, a training college for English Jesuits, is attached to the college and is recognized by the board of education.

Stonyhurst College is the mother school of several other Catholic schools in the British Isles, including Clongowes in Ireland, Mount St. Mary's in Derbyshire, and St. Francis Xavier's in Liverpool.

See Jesus, Society of, Educational Work of.

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STORY-TELLING. — At no time have story-books of all kinds been so numerous, so attractive, and so easily obtainable as now. Modern methods of teaching develop the technique of reading at an earlier age than formerly and also make children acquainted with good literature while still in the primary grades. Librarians are coöperating with schools and other agencies in encouraging the early formation of the habit of reading that which is worth while. Why, then, the need of story-telling, since children and young people can so easily help themselves to the best? What are the values accruing from this method that do not accompany the silent or oral reading of the same matter?

In the first place, however early the age at which children get a fair mastery of the technique of reading, their appreciation, taste and desire will for a long time outrun their ability to secure for themselves what they crave. Again, the story-teller will exercise a discrimination in selection which few collectors and publishers have the judgment or courage to do. Books to be read must make an appeal to a very large and very miscellaneous public, while the telling of a story permits the most perfect adaptation of literary material to a particular group. The story-teller must become more or less of an expert and artist in selecting and rendering the tales. He will choose the finest things of their kind suited to the plane of his hearers. Children will therefore be introduced to literature of a type which many would never attempt without inspiring leadership. Teachers can direct and widen the reading of pupils by telling a story up to a certain interesting point and then leaving them to go on with it alone. Or, one or two of the best of a cycle of stories such as the King Arthur, Robin Hood, or Siegfried cycles may be told, thus opening up to pupils a new world of beauty, romance, and valor. With like purpose, one or two of an author's most fascinating stories may be told, the pupils being directed where they may find others by the same writer. But it is in the deepened appreciation and heightened pleasure that the chief value of story-telling lies. The personal element reënforces the intrinsic worth of the tale, causes high-lights to appear, and gives perspective and added significance to the whole. The flash of feeling, the quality of tone, the right stress at an important turn in the story, a quickening of rate at a thrilling moment, a judicious pause at the climax, tend to secure a certain emotional effect and to lift the audience to the narrator's plane of wider vision. While the children who have not mastered reading have a greater need for hearing stories told, the purposes just cited are of sufficient importance and validity to warrant a more general use of this method in the upper grades.

In selecting stories to tell we should be governed by the literary worth of the material, the purpose to be fulfilled, the age of the hearers, and their dominant tastes and interests. Stories are too frequently selected wholly from the standpoint of a narrow purpose. They are chosen as carriers of information, as effective adjuncts to some study, or to point a moral, without regard to their intrinsic worth as stories. It is safe to say that unless a fairly high standard is maintained as to theme, form, structure and diction, the finest emotional response cannot be obtained and the ethical effect, if such has been the object, will be lessened if not defeated. If the purpose be enjoyment or the cultivation of a taste for real literature, then the importance of a rigid application of standards of worth becomes at once apparent. We can occasionally afford to read aloud something of passing interest and of momentary value, but rarely is one justified in spending on any but the very best tales the time and energy necessary to prepare for telling them.

In all essential points any story worthy of being told, whether in the nursery or the high school, must conform to the requirements of a good short story. It must embody an interesting dominant idea. This does not necessarily imply a "moral" though no high ethical effect can be obtained without such an idea. There must be one preëminent character in whom interest is immediately aroused and who is the central figure throughout the story.

A well-defined plot is just as essential to the story as to the drama, and this implies the accompanying features of developing incident, suspense, climax, and a satisfying ending. In the case of stories for children, this ending should be happy, that is, it should fulfill the principle of poetic justice. Structural perfection is more important in a story to be told than in one to be read. The listener is more helpless than the reader. He cannot skip uninteresting description or unimportant incident which halts the story. Neither can he go back to verify a point, to read again an obscure passage, or to get the significance of a foreshadowing event.

Having chosen the best obtainable version of any given story, some further modification to suit a special occasion or particular group may be advisable. In the case of tales which deserve to be called classic, any radical change is to be deprecated. But condensation, provided it be not so ruthless as to eliminate essential features of the plot or destroy charm of style, is considered legitimate. How this can be done and still preserve all the fine quality of the story is shown by Miss Lyman in *Story Telling, What to Tell and How to Tell it.* A lack of vivid portrayal may often be remedied by changing the indirect discourse into the direct form. The actors then speak in character, and what was more or less colorless narrative becomes a scene with action and dialogue. All interpolations of the author or the supposed listener, such as occur in many of W. D. Howells' stories for children, and in some of Kipling's, should be omitted in telling. When read, such side remarks serve to introduce the reader into the intimate circle of the writer and his original audience, real or imaginary, but in oral form they cause a distinct loss in the onward movement of the story and in incremental interest.

To tell a story effectively it is necessary first to grasp the theme or the dominant idea, — upon the narrator's conception of this, the feeling and tone will depend. Whatever will help one in this interpretation, such as a study of other similar stories, if the selection be a folk tale, or an extensive reading of stories by the same author in the case of modern writers, should be used as a means toward a complete rendering of the meaning. For example, the stories of Hans C. Andersen need such side lights for a full interpretation and appreciation. Few people can tell in a convincing and appealing way a story which they do not like. Sympathy with the leading character is all-important, and the complex tale with warring motives where one cannot easily decide where sympathy should be placed is not adapted for telling. Some find an outline of service in mastering a story, but probably a more generally useful method of making it one's own is to fill out the scenes as they occur, consciously and vividly, as mental pictures, so that the narrative moves as a play does, by acts and scenes. Each time the story is read, in preparation, one should try to see these mental pictures more vividly and clearly. There is some difference of opinion among experts as to the advisability of memorizing stories to be told. The writer believes the weight of argument deduced from the psychological and artistic aspects of the question as well as from the best practice, is somewhat against this method. All agree, however, that there should be fidelity to the best form obtainable of any given story, a strict schooling in beautiful diction, and an actual memorizing of enough of the characteristic phrases to give the true flavor of a certain style or type. It should be remembered that story-telling and dramatic representation are two quite different things. In telling a story we wish the pictures, the action, the characters, to be seen and heard in their own setting of time and place, perhaps in the "long, long ago" or the "far away." To this end the one telling the story should obtrude his own personality as little as possible. Mannerisms, excessive use of gesture, and attempts at great realism in representing attitudes, sounds, or actions are apt to spoil the illusion, and effort to secure elocutionary effects is quite out of place.

Beyond the kindergarten, the school has not made enough use of story-telling for pure enjoyment. Too much analysis and critical study, insistence that the children give back the story almost immediately, and constant use as a basis for oral and written language work, all tend to formalize the story-telling and to interfere with the spontaneous emotional reaction. Literature is an art form, story-telling is an art expression, and highly intellectual or didactic procedure is not compatible with their highest values.

Story-telling is extensively used in the kindergarten and primary grades. There is also evidence that recently a greater use is being made of this method in the upper grades. Playgrounds, social settlements, camps for boys and girls, and libraries having a children's department, almost invariably have a story hour for groups of children of varying ages. The Sunday school is awakening to the possibilities which belong peculiarly to this mode of religious and ethical instruction. In all the leading kindergarten training classes, normal schools, library schools, schools for religious workers, and colleges having a department of education, courses are now given in story material and the method of story-telling. The National Story-tellers' League has done much to foster and spread an interest in story-telling as an art. The number of professional story-tellers is also an indication of the wide extent of public interest in the subject. A. E. M.

See LITERATURE, CHILDREN'S; NURSERY RHYMES.

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STOVES. — See Heating of School Buildings.

STOW, DAVID (1793–1864). — British educator, author of the *Training System*, born at Paisley on May 17, 1793. He became "connected in 1181 with an extensively engaged commercial firm" in Glasgow. The way between his lodgings and the counting-house lay through the Saltmarket, then the abode of "shameless profanity, indecency, and filth." At first he felt only surprise and sorrow; he had been in the city five years before he felt sufficient confidence to attempt an improvement. About 1816 he started a Sunday evening school for the whole slum, but "each night brought different pupils from various quarters; . . . their homes were widely scattered; they in consequence could not be easily visited and the plan thus proved comparatively ineffective." Stow therefore decided to concentrate his efforts on the two worst lanes in the district. "He soon knew the circumstances of every family, the name and disposition of every child," and succeeded so well that his method was copied in other slums. Still he was not satisfied. A few hours spent in the Sunday school could not counteract the influence of a week spent in the street, and he was convinced of the "necessity of changing the street training into school training and of bringing the power of habit during the whole week to the side of religion." Believing that "to begin well we cannot begin too early," he resolved to start with children under six. The public was slow to subscribe the necessary money, and it was not till 1826 that the Glasgow Infant School Society was formed. Even then the funds permitted only of the renting of a cottage.

Here Stow gradually developed his training system. He drew a broad distinction between teaching and training. "*Teaching*," he said, "is not *training*. . . . Perhaps the most serious practical mistake that continues to be made in modern times is the confounding of two things essentially and inherently different. . . . We hear from all quarters 'Train up a child,' but on explanation the process that is actually meant is *teach* or instruct, not train. The pupil is *told* by the master but left to train himself in whatever way he may choose." Other schools were concerned only with the mind of the child; the body was ignored, except as the means of stimulating the mind, and the character was left to form itself. Lessons were so subordinate a part of Stow's scheme that books were entirely excluded, but the physical training and the moral training were direct and continuous. For intellectual training he relied largely on what he called "picturing out." His own definition does not explain this process, but it appears from the instances given to have been a mixture of questioning with illustrations from sensible objects and from analogy. Many of the questions were elliptical, and many of the answers simultaneous. For moral training he relied largely on what he called "the sympathy of numbers."

Though Stow began with an "initiatory" school, he considered his principles to be of universal application, and he started a "juvenile" school in which they were applied. For a time most of the money for both came out of his own pocket, but his self-denying labors at last produced their effect. In 1835 the Glasgow Educational Society (built on the ruins of the Infant School Society) took over the school and resolved to establish a normal seminary. About a hundred teachers had already studied the training system, but the seminary would afford better models and a more thorough preparation.

The new buildings were opened in 1837, but a debt of £10,000 greatly crippled the institution. "Finding further appeal to the Christian public useless," Stow in 1842 applied to the government for an immediate £5000 and an annual £500. The application was granted on condition that the college be formally affiliated to the national church. Stow, being a good Presbyterian, saw no objection, but next year came the disruption. Stow and all his teachers except one were seceders, but with the help of the English Wesleyans they carried on the work till the existing Free Church Training College was built for them. Here Stow labored till his death (on Nov. 6, 1864), though he was far from satisfied with the results of the minutes creating pupil-teachers and offering grants to schools. He thought that pupil-teachers were too young to be moral trainers, and that the grants would make instruction the first consideration.

It was the first consideration before his time, and he rendered good service to education by showing that teaching is not necessarily training, though he went too far in implying that the two are incompatible. D. Sa.

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Stow, David. *The Training System.* (This was first published in 1836. It passed through at least twelve editions, steadily increasing in bulk.)

STOWE, CALVIN ELLIS (1802–1886). — Educational writer and college professor; was educated in the academies of Massachusetts, Bowdoin College, and the Andover Theological Seminary. He was professor at Dartmouth College, the Lane Theological Seminary, and the Andover Theological Seminary. He made a study of the school systems of Europe, and his *Elementary Education in Europe* and *Instruction in Prussia*, both published in 1837, greatly influenced Horace Mann, Henry Barnard, and the other leaders of the American common school revival. His other educational writings include *Teachers' Seminaries, Religious Element in Education, The Bible as a Means of Intellectual and Moral Improvement*, and many papers on educational subjects. He was one of the founders of the Western Literary Institute (*q.v.*), one of the earliest American associations of professional teachers. W. S. M.

STOY, KARL VOLKMAR (1815–1885). — Leading pedagogue of the Herbartian school, was born at Pegan, Saxony, and educated at the "Fürstenschule" in Meissen. In 1833 he went to the University of Leipzig to study theology, philology, and philosophy. Through Drobisch, a prominent Herbartian, he was attracted to the philosophy of Herbart and to pedagogy. After receiving his doctor's degree from the University of Leipzig, he went to Göttingen, where he came into personal relations with Herbart. Feeling the need of a practical acquaintance with educational problems before settling down to lecture on pedagogy, he took a position at a boarding school at Weinheim in Baden (1839). There he found a very active school life, including school excursions, dramatic exhibitions, and manual training, all of which he applied later on in his own institution in Jena. In 1843 he began to lecture as privatdocent at the University of Jena and founded a pedagogical society, afterwards the pedagogical seminary which has become so well known through the work of his successor, Wilhelm Rein. The following year he took over a boarding school in Jena which became known as "Stoy'sches Institut" and was very successful. Not finding in Jena on the part of the faculty of philosophy the support to which he thought himself entitled, Stoy in 1866 accepted a call to the University of Heidelberg, where he remained for eight years with the exception of six months (1867) when he organized the first Austrian Protestant teachers' seminary at Bielitz in Silesia. In 1874 he was recalled to Jena as professor of pedagogy, and remained there to the end of his life. He reëstablished the seminary and also founded a higher girls' school where he himself gave the instruction in pedagogy. At the university he lectured on psychology, pedagogy, the life of Herbart, introduction into philosophy, and logic.

His most important works are his *Encyclopædia, Methodology, and Literature of Pedagogy*, Leipzig, 1861, 2d ed., 1878; *Hauspaedagogik* (*Home Pedagogy*), Leipzig, 1855, a book for mothers; *Pädagogische Bekenntniss* (*Pedagogical Confessions*), 1844–1855; *Der deutsche Sprachunterricht in den ersten sechs Schuljahren* (*German Language Instruction in the first Six School Years*), Heidelberg, 1842; *The Organization of the Teachers' Seminary*, Leipzig, 1869, and an elementary textbook of psychology, published in Leipzig, 1870.

F. M.

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Fröhlich, G. *Dr. K. V. Stoy's Leben und Wirken.* (Dresden, 1885.)

STRACHAN, JOHN. — A Canadian educator, born in Aberdeen, Scotland, April, 1778. He was educated at the grammar school of that city and at King's College, Aberdeen. He became a schoolmaster at the age of nineteen and later was made assistant to Rev. James Brown, professor of natural philosophy in the University of Glasgow. He came to Upper Canada in 1799 to assume the headship of the university projected by Lieutenant Governor Simcoe. On the failure of the university scheme, he took up the work of schoolteaching and later (1803) entered the ministry of the established church. In conjunction with the mission at Cornwall, to which he was appointed, he conducted for nine years a grammar school, and on his appointment to the rectorship of York (now Toronto) in 1812, he continued his work as schoolmaster, a work for which, it would seem, he possessed exceptional gifts. He was made archdeacon of York in 1825 and bishop of the diocese of Toronto in 1839. As the leading churchman of the province, Dr. Strachan was the great protagonist of the Church of England in the struggle for the special privilege of that church as against the claims of the various dissenting bodies.

As chairman of the board of education for the province and as a member for many years of the legislative council, Dr. Strachan was a leading participant in the movement for the spread of popular education. He was unwearied in his efforts to secure the establishment of a provincial institution of higher learning. After much controversy and delay, this institution (known at the outset as King's College) was opened in 1843 with Dr. Strachan as its first president. There followed immediately a series of attacks on the charter of the institution on the ground of its denominational character. The charter in question was, in spite of Strachan's strenuous opposition, amended in 1850 so as to admit other denominations to equal privilege with the church of England. Upon this, Dr. Strachan and his friends withdrew and established a university of the church of England known as the University of Trinity College. He died in 1867. H. T. J. C.

STRAIGHT, HENRY H. (1846–1885). — Science teacher; graduated from Oberlin College, and subsequently studied with Agassiz (*q.v.*) at the Penikese Summer School. He was principal of the Peru (Neb.) state normal school; and instructor in science at the Oswego (N.Y.) state normal school and the Cook County (Ill.) normal school. His publications include *Aspects of Industrial Education* and various papers on science teaching. W. S. M.

STRASSBURG, EMPEROR WILLIAM UNIVERSITY OF. — An institution situated in the capital of Alsace-Lorraine, and established in the year 1621 under Emperor Ferdinand II. It owed its origin to an academy which had been founded as early as 1567 by the humanists as a Protestant stronghold of learning, the theological tendencies of the institution being strongly emphasized. The new university, which began its activity with the four traditional faculties, experienced many hardships during the Thirty Years' War, but attained considerable renown during the seventeenth century, attracting students from all sections of Europe. In 1681 the city passed into the hands of France, but the French rulers did not interfere with the German and Protestant character of the institution. Nevertheless, it gradually lost much of its former international prestige, the proportion of French students continually increased, and finally, in 1793, it was forced to close its doors, owing to the turmoil of the French Revolution. The French government was naturally not inclined to resurrect the institution along former lines. In 1794 a French medical school was organized in Strassburg, and this was followed by a school of pharmacy; nine years later a Protestant academy was established; in 1806 a faculty of law was organized and two years later a faculty of philosophy, the various institutions being at the same time combined into an academy which was later styled a *Université de France*, a Protestant theological faculty being added in 1818. The connection between the different faculties was only a loose one, however, and the institution was dissolved during the German occupation of Strassburg in 1870.

Shortly after the conclusion of the Franco-German War the old university was reorganized with faculties of theology (Protestant), of law and political science, of medicine, of philosophy, and of pure science, the formal opening taking place on May 1, 1872, 212 students being enrolled under forty-five instructors. The work of reorganizing the new institution had been intrusted by Bismarck to the Baden Minister, Baron von Roggenbach. An era of building activity soon set in, Strassburg enjoying a distinct advantage in having been able to plan for most of its structures at one time, with the result that it possesses one of the most homogeneous groups of buildings of any German university. The medical institutes and clinics are grouped together beside the city hospital, about a mile distant from the main building and the natural science institutes. Strassburg is the only imperial university in Germany, and was named after Emperor William in 1875. In 1903 a Catholic theological faculty was added. A dormitory is connected with the Protestant theological faculty. The university and provincial library was reorganized in 1870, a building being completed in 1894. The library is one of the largest university collections in Germany, containing about 975,000 volumes and almost 12,000 manuscripts. The city library contains about 125,000 volumes and pamphlets, 724 incunabula and 894 manuscripts. Connected with the main group of buildings are a botanical garden and an observatory. The zoölogical institute contains a more extensive collection than any similar institute in Germany, with the exception of those in Berlin and Hamburg.

Among the prominent teachers who have been connected with the University may be mentioned Varrentrapp in history, Laband and Lenel in law, and Röntgen in physics. During the winter semester of 1911–1912 there were 2138 (42 women) matriculated students, and 43 male and 117 female auditors in attendance. Of the matriculated students 1008 were enrolled in philosophy, 469 in medicine, 428 in law, 148 in Catholic and 86 in Protestant theology. The faculty consists of 172 instructors, of whom 61 are docents. The annual budget amounts to about $400,000.

R. T., Jr.

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STREAM OF CONSCIOUSNESS. — A phrase given wide currency by William James and designed to emphasize the fact that consciousness is in constant flux, ideas, sensations, feelings, following one another in unending succession. The term "stream" calls attention to the fact that the items in the field of consciousness which we can introspectively distinguish, *e.g.* images, pains, percepts, do not occur in any real isolation from one another, but are parts of the wider mental current upon which they are borne along.

Nevertheless, there are gaps — time gaps, as in sleep and coma; and quality gaps, as when a sensation of sound infringes upon and displaces a sensation of color. These gaps do not, however, affect our feeling of the coherency of consciousness as a whole. The term "stream" also suggests that a thought once gone never literally recurs. Another thought like it may come, but the original never returns.

James also makes the simile apply to the fact that the movement of thought is sometimes rapid — as in "transitive states" — and sometimes slow — as in "substantive states." The analogy is not particularly helpful as applied to the other main characteristics which James emphasizes, *i.e.* the fact that every state of consciousness is part of a personal consciousness, and presents itself as such. But all things considered, the metaphor is a useful one and tends to accentuate the fact, easily overlooked by an analytical psychology, that percept, images, feelings, emotions, memories, and acts of will are all parts of a larger forward-moving process. J. R. A.

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STREAM OF THOUGHT. — See Apperception; Consciousness; Thinking.

STRUCTURAL PSYCHOLOGY. — See Psychology, Functional.

STUBBORNNESS. — See School Management.

STUDENT AND SCHOOLMASTER. — See Journalism, Educational.

STUDENT ASSOCIATIONS, INTERNATIONAL. — See Teachers and Students, International Exchange of.

STUDENT ATTENDANCE IN UNIVERSITY AND COLLEGE. — See College and University Student Attendance.

STUDENT EMPLOYMENT AND AID. — See Student Life.

STUDENT LIFE. — **Schools of the Middle Ages.** — The Cistercian novice-master Cæsarius v. Heisterbach, towards the end of his priceless *Dialogus Miraculorum* (Dist. xii, c. 46) tells us how a recluse once looked out from her cell upon the tomb of a newly buried scholar. She saw a white lady who took a white dove from the grave into her arms, saying, "I am the Mother of Christ; and I am come to fetch the soul of this scholar, who is a true martyr." "And truly," continues the novice-master, "if scholars live innocently and learn willingly, they are indeed martyrs." These words, written about 1235, plunge us at once into the atmosphere of the medieval pupil room. The Saxon Ælfric of 230 years earlier, and Erasmus 250 years later, give us the same impression that learning could only be conquered then (as by many even in Gibbon's time), "at the expense of many tears and some blood." In Ælfric's *Colloquy*, the Master's first question is, "What do you want to say?" and his second, "Will you be flogged while learning?" To which the scholars make answer: "We would rather be flogged while learning than remain ignorant; but we know that you are a kindly man and will not flog us unless you are obliged." The *argumentum ad hominem* was (let us hope) effective in this particular case; yet the historian must confess that it is untenable as a general proposition. Eadmer tells us of "a certain Abbot, much reputed for his piety," who complained to St. Anselm, "what can we do with our cloister-scholars? They are perverse and incorrigible; day and night we cease not to chastise them; yet they grow daily worse and worse." Anselm, being not only a saint and a genius, but a man of rare common sense, was able to suggest that gentler methods might prove more effectual in the long run.[1] Yet Guibert de Nogent, a generation later, gives an equally painful picture of his own training under a private tutor in his father's castle. (*De Vita Sua*, lib. I, c. 4.) Though "of great modesty," the teacher "loved me with a cruel love," and almost daily beat his pupil black and blue. The same spirit is enshrined in the constitutions for monastic schoolboys (the so-called *oblates*) published by Martene in Vol. IV of his *De Antiquis Ecclesiæ Ritibus*. "Let a master be ever among them with his rod and, if it be night, with a candle . . . for children everywhere need custody with discipline and discipline with custody." There is scarcely any childish transgression, even of the most pardonable and natural character, for which the rod is not definitely invoked in these constitutions. "It is scarce possible," concludes the lawgiver, "that any king's son be more carefully brought up in his palace, than any boy in a well-ordered monastery." Yet the disciplinary writers even of such model monasteries (and these, by the confession of contemporaries, formed always the small minority) were constrained to admit that such pupils grew up into either the best or the worst specimens of monasticism, and the oblate-school was dropped by common consent before the end of the Middle Ages. It was to some extent revived by the Brethren of the Common Life; yet even among these reformers, if we may believe Erasmus, the moral and intellectual results bore but a disappointing proportion to the severity of the methods. Schools must always reflect many of the characteristics of society; and, in the ages of force, scholastic methods were unquestionably too violent. Grammar school founders did much to imitate the monastic ideal; we have only to glance at the bird's-eye view of Winchester College, as given in Mr. A. F. Leach's book, to realize how prominent was the idea of claustration in the founder's mind. Games are scarcely ever mentioned in early school or college statutes except by way of reprobation. We may sympathize with Henry VI's emphatic prohibition, for his scholars and fellows of Eton, of "hunting dogs, hunting-nets, ferrets, hawks, falcons . . . monkeys, bears, foxes, bucks, roes, fawns, badgers, or any other such ravenous, rare, or unwonted beasts, which are of no profit and may do much harm." When, again, the Winchester boys and New College scholars were expressly warned not to dance or play at ball games in their hall or their chapel, for fear of the structural damage which might ensue, we must consider the prohibition no less reasonable than necessary. Moreover, though it may surprise us at first sight that even chess should be forbidden to the scholars of New College as a noxious, inordinate, and dishonest game, we must remember that it had a bad reputation among medieval disciplinarians for the gambling and quarrels to which it gave rise. But it is difficult to forgive Wykeham for having forbidden even fishing at Winchester; or to justify Henry VI's strict injunctions "that no Scholar or Chorister of the said Royal College shall on any pretence, without special license, leave the College walls or enter the towns of Eton or Windsor, without the escort of a præpostor, vice-præpostor, or master." It is but dust in the balance, on the other side, that Shrove-Tuesday cock-fighting (*q.v.*) should have been a time-hallowed institution; that Wykeham should have permitted to his scholars the almost universal license of the Boy Bishop (*q.v.*), or that he should have authorized those mild and occasional after-supper recreations which Warton first quoted some 150 years ago. "In Winter tide" (prescribes the Founder), "when the Fellows enjoy a fire in Hall in honour of God or His Mother or of any other Saint, then, when dinner or supper is over, let the Scholars and Fellows be permitted to while away a decent space in Hall, for recreation's sake, with songs and other honest pastimes; and let them discuss, in no spirit of levity, Poems, Chronicles of Realms, the Marvels of this World, and other topics which befit their clerical state." "When the Fellows enjoy a fire" tells its own tale; the original college classroom had no fireplace, it depended for warmth upon its southern aspect. And the last words of the quotation may remind us that not only the medieval university students, but even the schoolboys, wore the clerical tonsure and had often formally received the minor orders. They were, as Chaucer calls them, *clergeouns*, and enjoyed the immunities, as they suffered the restrictions, connected with that word in the Middle Ages. There was, however, one important exception which we have already anticipated. By canon law, anybody who should strike a clerk was *ipso facto* excommunicate, and his absolution was reserved for the Pope himself. But, lest this should cut the very sinew of medieval discipline, a clear exception was made in favor of ecclesiastical superiors; so that clerks in minor orders "might be smitten, even for trivial offenses, by any competent authority." Indeed, when a Master of Grammar took his degree, he entered formally into his office, not by the ceremony of giving a specimen lecture, like the Master of Arts, but by inflicting a foretaste of castigation upon a "shrewd boy" chosen *ad hoc*, who afterwards received fourpence "for his labour."

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[1] Eadmer, *Vit. Anselm.* l. I, c. 4. The passage is summarized in R. W. Church's *St. Anselm* and fully translated (with that from Guibert de Nogent and many of the monastic constitutions) in G. G. Coulton's *Medieval Garner* (London, 1910). There are many original documents bearing on student life in this last book, especially pp. 34–48, 89, 270–289, 376, 412, 448, 486–489, 559, 588, 597, 641, 670.

The medieval school holidays were simply the church holidays, coming at irregular intervals, but amounting in the aggregate to very nearly the same total as the modern system of Wednesday and Saturday afternoons. The longer holidays received no official recognition at Winchester; many boys evidently did go home for periods of ten days or a fortnight twice or thrice a year, but the school as a whole ran on continuously all this time. "For more than a century, there was no breaking-up day and no general emigration home" (Leach, p. 179). At Eton, the statutes provide that "if any boy is carried away with the desire of visiting his parents or guardians," he may have three weeks at Ascension-tide; but it is expressly enacted that, if his absences during the whole year amount to more than one month, without special license from the master, he must be expelled. The same penalty is decreed against any scholar above the age of fourteen who should have committed "notable theft, manifest perjury, wilful manslaughter, violent assault (*atroci percussione*) upon præpostor, vice-præpostor, master, or usher, . . . or matrimony." These Eton præpostors were the same as the Winchester prefects (*q.v.*). Some were responsible for discipline in class, others "when they play, for fyghtyng, rent clothes, blew eyes, or siche like," as the headmaster of Eton wrote in 1530 (Leach, *Charters and Documents*, 450). There was also a third class of "præpositors for yll kept hedys, unwasschid facys, fowle clothis and sich other" — little cares which, at the less aristocratic Harrow, were among the statutory duties imposed upon the principal. Eton had also her præpostors for chapel, and her statutes fulminate against all scholars who should be guilty of "murmurs, chatterings, mockings, laughter, gossiping, or indiscrete noises of any kind; lest by their inordinate tumult, and the manifold sounds of their voices, or other interchange of talk, any sort of hindrance be given to the devotions of others, or to their exercise who sing the psalms in choir." This necessarily brief sketch, dwelling mainly upon the peculiarities of medieval school life, may be fitly concluded with a reference to the dormitories. At luxurious Winchester it was expressly enacted that each scholar's bed should be his castle. At Eton, those under fourteen were obliged to share beds with a comrade; at Wells Choir School, one greater boy slept in the middle, and two smaller with their heads towards his feet. These statutes were drawn up by Bishop Bekynton, who had taken a prominent part in the foundation of Eton.

The status and age of the boys has been well discussed in Leach's *Winchester College*, pp. 92 ff. and 159 ff. He shows that, in spite of the phrase "poor scholars," which had become as stereotyped as the "honorable member" of our national assemblies and debating societies, the Winchester boys came in fact from well-to-do homes and were fed and housed on a proportionate scale. Moreover, although many boys did in fact go to the universities at an age at which they would now scarcely have left their preparatory schools, yet Winchester and Eton scholars evidently remained at school, in the ordinary way, until the age of eighteen.

Professor Carleton Brown has admirably analyzed Chaucer's indications of classroom routine in the fourteenth century. (See bibliography.) Earlier evidence may be gleaned from Guibert de Nogent, as quoted above, and from the friar Salimbene (*c.* 1280), who describes a new religious sect as gathering round their founder in a common room and crying aloud in chorus "a hundred times or more, *Pater, Pater, Pater!* Then after a brief space they would begin again, and chant *Pater, Pater, Pater!* after the wont of boys in grammar schools, when they repeat in chorus at intervals the words which have been spoken by their master." Two generations later, Bishop Grandisson of Exeter attempted to reform grammar school education in his diocese by an emphatic circular which shows us the same unintelligent methods still prevailing (Leach, *Charters and Documents*, p. 314; extremely interesting curricula for the early sixteenth century may be found *ibid.*, pp. 448 ff.). The boys began to read with hornbooks, from which they were promoted to the Psalter or Primer: *Psalterium docere* and *discere* are phrases commonly applied to masters and scholars. Much of this was mere parrot learning; such construing as went on was done into French until the middle of the fourteenth century. On the other hand, boys were constantly exhorted to speak Latin at school, or at least French (see ANGLO-NORMAN DIALECT; ANGLO-NORMAN SCHOOLS); Wykeham seems to have been the first founder who allowed them the freedom of their native tongue. The result was a license of English grammar and spelling which may surprise even those who are most willing to grant that orthography may be an overrated accomplishment. The Celys and their correspondents, well-to-do merchants of the later fifteenth century, write of St. Olave's, their own parish church, as *Sent Tolowys serysshe*. They give *Sent Telen* and *Sent Tanys* for St. Helen and St. Anne's; *Sent Tandros*, again, is solemnly engraved on the ancient chalice of St. Andrew's, Cambridge. The grammar of the Celys and their contemporaries is to match.[1] There is good evidence, again, that one of the weak points of medieval university education was the unripeness of grammar students. All lectures were in Latin, yet many came up with small Latin in their heads.[2]

In the Early Universities. — Whether we take a general survey with Dr. Rashdall and Mr. Rait, or dip for ourselves into original documents printed by Denifle, Zarncke, and Anstey, our first and abiding impression of medieval university life is that of its turbulence and roughness. Some of the contrasts between past and present civilization may indeed rest mainly upon conventional distinctions, but it is equally true that even the noisiest mirth of our ancestors was often a more or less conscious protest against the hardness of their daily lot. Most of the wandering students, *vagantes* and *goliardi*, whose songs ring down to us through the centuries, would have echoed the words in which Dr. Johnson describes his own outbursts at Oxford: "Ah, Sir, I was mad and violent — it was my bitterness they mistook for frolic." It is difficult to say that poor men were more numerous at medieval *Studia Generalia* than at the average modern university,[1] or that they led an easier life. We are often told that poverty was not stigma in the Middle Ages, and that the penniless student, at least after St. Francis had set the example, could beg without shame. This is, however, a great exaggeration, as may be proved by reference to the autobiographies of Salimbene and Burckhart Zink, which tell us the plain contrary, and are borne out by many indications from other sources.

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[1] *Cely Papers*. (Royal Hist. Soc., 1900, pp. viii ff.)

[2] The reader should refer to the two letters written from Eton by William Paston (Nov. 7, 1478, and Feb. 23, 1479. *Paston Letters*. Ed. 1900, iii, 237–240). They give more insight into school life and scholastic proficiency than any other documents of equal length.

Avoiding the very rich and the very poor, let us try to take the life of a typical middle-class student at such a typical university as Oxford. Here again we must necessarily emphasize the contrasts; the similarities are well brought out in Professor Haskin's article alluded to below. The large majority of scholars aimed at some clerical preferment, whether in the narrower modern or the wider medieval sense. Until the Black Death, a large proportion were boy rectors, whom the Bishops had first instituted, and then sent to study; and the available evidence tends to show that then, as now, the average undergraduate was fairly easy as to his future and looked to his university course quite as much for present enjoyment and future professional advancement as for the pursuit of abstract intellectual ideals. Our freshman, unless he travels with a "fetcher" or "carrier," will run a measurable risk of making his first acquaintance with his fellow-students in the guise of amateur banditti: for student-highwaymen sometimes haunted the Cambridgeshire fens as well as the hills round Oxford. Hence the utility of the carrier, not only to deliver mere parcels safely, but to guide and guard a caravan of living souls, who, on these journeys to and fro, were expressly permitted to break the usual prohibition against bearing swords, bows, and bucklers. Some relics of this importance of the medieval carrier, it will be noted, clung still round Cambridge Hobson in Milton's day. The freshman's first and only disciplinary duty in the earlier days was to register himself under some master, who (if we may trust to the Chancellor's books) might unfortunately turn out to be an even wilder person than the average undergraduate. In the fifteenth century, however, from which our most definite evidence comes, the student was practically compelled to do more than this, and enroll himself in some College or Hall (*q.v.*). Yet college accommodation was, even then, extremely scanty; it is very unlikely that more than 200, or 250 at most, could have been housed in all the Oxford Colleges of 1400 A.D. put together. Let us hope, however, that our student has not come up in the hope of finding that Eldorado pictured by the author of *Piers Plowman:* —

For if heaven be on this earth, and ease to any soul,
It is in cloister or in school . . .
In School there is scorn, but if a clerk will learn,
And great love and liking, for each of them loveth other.

This ideal (like Charles Lamb's) reads like that of a wistful outsider; and Dr. Rashdall is probably nearer the mark when he surmises that there is scarcely a yard of Oxford "High" which has not at some time or other been stained by a student's blood. For England we have only vague evidence of the pains inflicted upon the freshman as such; but, at Continental universities, we know that the *bejaunus*, or greenhorn, suffered deeply. He passed through a solemn ordeal, which the university statutes are first found prohibiting altogether, then only regulating to the best of their power, and finally admitting as inevitable in human nature, and as profitable (if duly taxed) to the masters' purses. A *Manuale Scholarium* of the fifteenth century, reprinted by Zarncke, describes the initiation of the Heidelberg freshman with extreme minuteness. From the first moment when his fellow-students affect to discover in the room a rare monster, the bejaunus, of hideous aspect and loathsome scent, down to the final scene in which all drink together in earnest of the feast with which the freshman has promised to regale his fellows, we scarcely know whether to laugh with the tormentors or weep with the victim. A medical student undertakes to remove his deformities by a series of burlesque, but not the less excruciating, surgical operations. The salves applied to his wounds do but add insult to injury; he is finally saved from syncope by the stimulus of far other essences than hartshorn or sal volatile. When exhausted nature can endure no more, he is given out to be at his last breath. Then a theological student comes forward to hear his last whispered confession; to interject questions and exclamations of horror which leave us plainly to infer the seven deadly sins one after the other; and finally to prescribe, as the one condition of valid ecclesiastical absolution, a banquet of initiation to be paid for by the victim. In France, this whole ceremony took the form of a mock trial. At Aix, for instance, "after the freshman had been duly accused by the promoter, he was sentenced to receive a certain number of blows with a book or frying-pan. On the highly philosophical principle that 'infinity may be avoided,' it was, however, prescribed that each freshman should not receive more than three blows from each of an unspecified number of students, but, if there were 'noble or honourable ladies' present, the rector might, upon their intercession, reduce the punishment to one from each operator."

Thus matriculated, both formally and informally, into that motley crew of students from sixteen to sixty — from the archdeacon, prebendary, or chaplain down to the half-fledged grammar boy — he would pursue his studies with much the same energy as the modern undergraduate; that is, at any pressure from full steam to no steam at all. St. Edmund Rich, after studying deep into the night, fought with a malicious devil between his pallet and the wall. At the other end of the scale came the so-called "chamberdekyns," of whom contemporary authorities complain that "they sleep all day, and prowl by night from one tavern or house of ill-fame to another, seeking occasions of homicide," and of whom Dr. Rashdall rightly remarks that, even after conviction, "in the majority of cases nothing worse happened to them than being compelled to go to Cambridge." Our average student steers a middle course between these two extremes. He rises at five, washes in the College Hall or Court, hears mass or not according to the pressure of his own conscience or of the college statutes, and is at lectures by six. These continue until dinner at ten or thereabouts. In earlier days, this would have been the student's first meal; but in the later Middle Ages an informal *jentaculum*, or breakfast, was prescribed for the less robust, and gradually became common. After dinner, recreation until twelve or one, and work until five o'clock supper. After supper, the colleges often had a "repetition" of the lectures heard outside during the day, followed by collation — an informal meal of the *jentaculum* type. Bedtime was eight or nine. This routine was often broken, of course, by the half-holidays of black-letter saints' days, and the whole holidays of red-letter festivals. The long vacation was short enough originally, if we may judge from a bull of Gregory X to Paris (Denifle and Chatelain, *Chartularium*, I, 138). It is there decreed that "the summer holidays shall not extend henceforth beyond one month; and bachelors may, if they will, continue their lectures through vacation time." At Bologna, again, it lasted from Sept. 7 to Oct. 19. But, 150 years later, we find the Parisian vacation stretching formally from June 28 to Sept. 15, and informally until Oct. 1. There can be little doubt that one reason, at any rate, for this extension was to enable students to help with the harvest. Most English college statutes, and some Parisian, provide for the continual residence of fellows or scholars, even during vacation.

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[1] The conservative traditions of Oxford and Cambridge make them rather exceptional there; yet even at modern Oxford and Cambridge there are many men who support themselves by daily work, and can study only in their spare moments.

The style of the lectures was much influenced by the rarity of textbooks among the audience. The booklessness of the Middle Ages has been much exaggerated by some, and absurdly minimized by others. The truth may be most briefly expressed thus: a well-written (not illuminated) Bible cost from £40 to £60 of modern money to produce, and Chaucer speaks of twenty volumes as a large collection even for an advanced student. Bearing this in mind, we may appreciate Odofredus' detailed description of the methods of a thirteenth century legist, which might be transferred, *mutatis mutandis*, to the philosopher or theologian. (See under UNIVERSITIES.[1]) An amusing description of the same scene from the scholar's point of view was penned by a Norfolk man at the end of the twelfth century. He describes how "certain great beasts sit with solemn pomp in the school, having two or three benches [of students] before them, and making pedantic notes with leaden pencils in their illuminated copies of *Ulpian*."

Originally, the lecturer delivered himself "as though he were preaching a university sermon"; or, in other words, "as though no man were writing before him." But in process of time the students demanded more indulgence; and a Parisian statute of 1355 attempts to check the abusive practice of dictating lectures to the audience word by word. All lecturers who descend to this uneducational level are to be suspended for a year, "and all students who impede the execution of this our present statute by shouting, whistling, stamping, stone-throwing, or any other device, whether by themselves or by means of their servants or abettors, are hereby deprived and cut off from our fellowship for a whole year."[2] References to these rough forms of protest on the undergraduates' part are very frequent in medieval statutes; and a fragment from a Spanish professor's autobiography seems to point to the most successful fashion of dealing with the difficulty. "One evening a hulking brute of thirty, student in theology and in ribaldry, howled out some filthy interruption. . . . I seized an enormous bronze compass, weighing three or four pounds at least, which stood on the edge of my desk, and flung it at his head. Luckily for us both, he avoided the missile, which would have dashed out his brains; but from thenceforward he kept quiet."[3] Of Dr. Crayforde, who was master of Clare Hall and vice chancellor of Cambridge in 1535 and 1536, his contemporary, Dr. Caius, reports that he was as good a gladiator as vice chancellor, and adds that he cut off one man's hand and threw another by main force out of the Regent House — *i.e.* the senate house. The Oxford inquests published by Thorold Rogers afford similar evidence of desperate and irreconcilable warfare between Town and Gown, or North and South. "The formal deed of settlement between the Northern and Irish scholars of Oxford in 1252 reads like a treaty of peace between hostile nations rather than an act of university legislation." Much of this violence was inherent in medieval manners; but it was undoubtedly intensified by the policy of university legislators. It is true that the frequently prohibited games of ball or bowls were generally rough, and really dangerous in the narrow streets. Yet, even so, it is difficult to understand why the authorities made so little attempt to regulate, instead of abolishing, the natural amusements of youth. The fact is that the medieval legislator had a horror of exceptions; he found it easiest to frame absolute and Procrustean statutes, leaving human nature to find its own working ratio in practice.[1] However, Dr. Rashdall has unearthed a few indulgences: a "soft ball" was allowed in one Parisian college court about 1510; a few German statutes permitted musical instruments at seasonable hours, "provided they *are* musical"; and at Leipzig there was even "a sort of public university ball, for the express purpose, it would seem, of introducing the students to the 'most honourable and elegant daughters of magnates, senators, and citizens.'" Indeed, in this last respect one or two universities seem to have adopted a more reasonable ground than that of the ordinary medieval moralist, who forbade dancing altogether. College statutes show us the scholars or fellows (for there was at first no distinction) enjoying an ordinary middle-class standard of food, dress, and general comfort. That of Montaigu at Paris, of which Erasmus gives so grisly a description in his *Ichthyophagia*, has often been erroneously quoted as typical; it was in fact deliberately managed on an exceptionally ascetic system. It has been remarked that the worst hardship faced by the average medieval student was the cold of the lecture-room in winter — unceiled, unglazed, straw-strewn, and drafty. But these were fairly common medieval conditions, only intensified by the student's bodily inactivity; and all but the poorest had their fur-lined gowns, of which some relics still survive in academical costume. Life was very hard, no doubt, for *Servitors*, *Battellers*, *Sizars*, *Beneficiarii*, who studied in the intervals of menial work for richer students, and fed on the broken meats from the fellows' table. Perhaps it was harder still for most of those who received an official license to beg; though the autobiographies of Zink and Platter prove that a not too scrupulous student might live in fair comfort even under those conditions. The poor scholar received little or no help from the "chests" which became so distinctive a feature of English universities — there were about twenty in medieval Oxford. These were capital endowments from which loans were made to students, without other interest than a certain number of prayers for the founder's soul. But the borrower was required to deposit a pledge exceeding the value of the loan; and, if most of these "chests" gradually drifted into financial difficulties, it was not through too charitable, but through too careless, administration. Corporal punishment, so frequent at all schools, was much rarer at the university, but apparently grew more frequent in the later Middle Ages. Dr. Caius fixed the limit at eighteen years for his college, and Wolsey at twenty for the present Christ Church.

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[1] For the description of a day's work at Louvain in 1476 see Rashdall, II. 766; for thirteenth century Bologna, *ibid.* I. 218.

[2] Bulaeus, *Hist. Univ. Paris*, IV. 332. A fifteenth century lecturer's method is described in Paulsen, *Gesch. d. Gelehrt. Unterrichts*, I. 35.

[3] Reynier, p. 24.

The crown of a student's life was naturally his *inception*, or graduation as master. This, like all other university ceremonies, was made an occasion of as much feasting as possible; and Clement V, at the Council of Vienne, attempted to limit the expenses to 3000 silver *tournois*, even in the case of the richest candidate.[1] But the University of Oxford repudiated "the strict letter of the statute"; and at the inception of George Nevile, brother to the Kingmaker and future Archbishop of York, a feast was made for 900 scholars and relations, in addition to "provisions for the poor and other sort of ordinary people of the university." The candidate was often assisted by his friends or patrons, as when Edward I granted three tuns of royal wine for the inception of Sir Nicholas de Cogenhoe's son. At Oxford and Paris, a poor student was permitted to do his *Determination* (*i.e.* take his B. A. degree) under the wing of a richer, whose expenses were judged to suffice for others besides himself. Determination was, in fact, a rudimentary form of inception, which had grown up from undergraduate imitations of the masters; and Dr. Rashdall gives a diverting description of the proceedings, which of course began with a disputation (I, 447): "Every effort was made to attract to the schools as large an audience as possible, not merely of masters and fellow students but if possible of ecclesiastical dignitaries and other distinguished persons. The friends of a determiner who was not successful in drawing a more distinguished audience would run out into the streets and forcibly drag chance passers-by into the school. Sometimes the halls were invaded by eager partisans for the same purpose. Wine was provided at the determiner's expense in the schools: and the day ended in a feast given in imitation of the masters' inception-banquets, even if dancing or torch-light processions were forborne in deference to authority."

Before passing from this subject, one word must be said of the student's letters which often throw so much light on university life.

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[1] Compare the Salerno statute enjoining that druggists should sell nearly all their drugs "at so much the ounce, without reference to the nature and composition of the preparation." (Rashdall, I, 84.)

[1] Rashdall (I, 232) interprets these as 3000 *pounds;* but the *turonensis argenteus* was a silver coin, worth one fourth of the contemporary shilling sterling. Even so, the modern purchasing value of the sum would be nearly £500.

Prof. C. H. Haskins has made a special study of these (*American Historical Review*, Vol. III, pp. 203 ff.); others may be found in Denifle's *Chartularium* (Vol. I, introd., no. 54), and in *Paston Letters* (nos. 816, 826, 829, 830, 831, in addition to the two already quoted above).

In the Reformation and Modern Times. — The Reformation made only gradual changes in student life; and medieval conditions lingered longer in Spain, as we might expect, than elsewhere. Reynier, dealing mainly with the later sixteenth and seventeenth century, shows us much the same conditions with which we are already familiar, with modifications due to the Spanish character. The freshman's initiation is as barbarous as, and even more disgusting than, that of medieval Heidelberg. The pomp of inception at Salamanca is even greater than at Oxford or Paris; the candidate must give a bull-fight of at least five bulls, and a feast of five courses; and the king himself does not disdain to attend. On the other hand, the new doctor has a *memento mori* in the shape of the *vexamen*, a burlesque examination concluding the serious business, in which a chosen disputant is privileged to expose and exaggerate all his personal weaknesses. The servitor and the "chamberdekyn" swarmed at these universities; they fought every morning for free soup at the friary gates, an old proverb ran "inveterate hunger — students' hunger," and Cervantes reckoned famine and vermin among the scholars' worst enemies. The idle amused themselves by hanging about convents — a distraction which, at Oxford and Cambridge, had been somewhat restricted by the rarity of adjacent nunneries, and the fact that two out of the existing three were suppressed by papal bulls before Henry VIII's reign (Littlemore and St. Rhadegund's). The Spanish student, like his medieval ancestor, went about armed, in spite of repeated and emphatic enactments; and duels were frequent. For one moment, at the Renaissance, Spain had bidden fair to rival other nations of Europe in learning; but the universities gradually sank back into such decay that, at some of them, there was a weekly whole-holiday for shaving (*dia de barba*).[1] Moreover, a closer study of seventeenth century university life, even in England, shows characteristic medieval survivals in very unexpected quarters. In 1626, a large cod sold in Cambridge market was found to have a book of devotion in his belly. A monograph was devoted to this portent (*Vox Piscis*, London, 1627); and the master of Sidney gravely reported the occurrence to Archbishop Ussher, who wrote back "the accident is not lightly to be passed over; which, I fear me, bringeth too true a prophecy of the state to come." About the same time, the rapidly growing population of New England greatly embarrassed such distinguished divines as Dr. Mede, who had constructed a most definite theory of the world's future upon the double basis of the Apocalypse and profane history — but that of the Old World alone. The paralyzing doubt now arose, whether America was destined to be the New Jerusalem, or (conversely) the home of reprobate Gog and Magog, with whom "our English should there degenerate and join themselves." The wisest heads could only leave the question unsolved; and, meanwhile, the authority of Aristotle and the dialectical method retained much of their medieval supremacy. In the eighteenth century, the universities shared the stagnation of the Anglican Church; but, at their worst, they kept far more life than those of France or Spain. J. R. Green's admirable papers trace the changes in eighteenth century Oxford. In the earlier years, some colleges still dined at 10 A.M.; the great antiquary Hearne marked the hour move on to eleven, and even at last to noon, upon which he writes: "When laudable old customs alter, 'tis a sign learning dwindles." In 1650, it had been scandalous for a divine to take tobacco; but half a century later the dean of Christ Church himself could print a smoking-song and set it to music. To us, the amount of strong liquor consumed from medieval to comparatively recent times is a matter of surprise, and sometimes even of Pharisaical comment; but 150 years ago a college Head was fulminating against tea and coffee drinking as "a fashionable vice which leads only to squandering of money and misspending the morning in jentacular confabulations." It is less unexpected to find Town and Gown joining hands, in 1774, to prohibit "attempts (which) have been made to inoculate persons for the small-pox within the University and City of Oxford." The lowest point ever reached by post-Reformation Oxford is marked by Gibbon's well-known description of "the monks of Magdalen" in his autobiography. Gray's letters give almost as unflattering a picture of Cambridge; and Gunning's Reminiscences, beginning from 1784, show how many bad old traditions lingered far on into the nineteenth century. The action of more than one Parliamentary commission, and the competition of the newer universities, have effected radical changes in English university life. In Germany, where the teachers never enjoyed anything like the same secure possession of wealthy endowments or the same intimate connection with a rich and powerful state church, student life was apparently less irregular and unprofitable even at the most torpid period of the eighteenth century. We have brief glimpses of this life in autobiographies; *e.g.* in those of Goethe, J. S. Seume, and H. Zschokke.

G. G. C.

In American Institutions. — American universities and colleges are unequaled in the variety and extent of the voluntary activity of the students outside the classroom. The *Student Annual* of a leading university, in itself a large and handsomely illustrated volume involving a great deal of labor and expense, will record the officers and members of from one hundred to one hundred and thirty undergraduate clubs, fraternities, associations, boards, societies, and other organizations. Much of this activity is of real educational value, since it develops not only the special talents of the members, musical, dramatic, oratorical, artistic, or athletic, as the case may be, but also a spirit of "team play" and the ability to manage business enterprises, often of considerable magnitude. But, on the other hand, it involves so much time and labor on the part of many students, and distracts the attention of so many more, as seriously to interfere with the prescribed work of the university.

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[1] Cf. V. La Fuente, *Hist. Ecc. de España*, Vol. VI, p. 124.

Foremost among the student interests comes athletics, especially intercollegiate football, which attracts immense crowds and brings in enormous sums of money. In the West previous to the spread of football the "oratorical contest" was the chief mode in which collegiate rivalry found expression. In the local competition the best speaker among the young men and women taking part is chosen to represent the college in the state oratorical contest and afterwards the champions of the several states compete. Many men now prominent in national politics were trained in these contests. Intercollegiate debating, first systematized in the East, is taken very seriously and requires more hard study by the contestants than many a regular course. The questions are usually the political and social issues of the day, such as the tariff, municipal government or regulation of monopolies, and in the triangular leagues the dates are so arranged that the two teams of a college, each composed of three men, are arguing upon opposite sides of the same question with the two other institutions on the same evening. The old-fashioned literary society, formerly the dominant collegiate organization, has declined in importance almost everywhere except in the smaller institutions. Journalism has become an absorbing occupation to many students, for every large university supports a daily newspaper and one or more literary or humorous monthlies. Much attention is now given to dramatics in various ways. Besides plays in foreign languages, German or French, more rarely Spanish, Norwegian, Greek, or Latin, the students often present old English plays from the period of the moralities to the Elizabethan. Comic operas with original words and music are produced at great expense, and these, as well as dramas written by undergraduates, are sometimes afterwards produced at the regular theaters.

Formerly most of the students in the American universities were preparing for the professions, especially the ministry. Latterly another element has been introduced, the so-called "leisure class," young men of wealth who have been drawn to the universities not from scholarly interests or tastes but because of the charm of college life, its social prestige and athletic attractions. It is not conducive to a proper deference and a teachable disposition for a student to know that he has a private automobile waiting at the classroom door which cost more than his instructor could earn in several years, or to think that his father is rich enough to set up in the vicinity a rival university bigger and handsomer than the one he is attending. But in spite of this, the possession of wealth or of social position makes less difference in the universities than it does elsewhere in American life. Every university prides itself upon its democratic spirit, and the students are quick to resent and penalize snobbery of any sort based upon external advantages. Even in the most expensive universities no student of marked ability need drop out for lack of money to carry him through. During vacation he can earn enough to pay his way, and during the school year there are many opportunities to be of service to the university by which he can get his tuition, while by tutoring or outside employment he can make up the balance. There are numerous instances of young men who have started upon a college course without any income and have ended with several hundred dollars ahead, having made a good record in scholarship and gained the respect of their classmates. Working students of Columbia University earned about $100,000 during the year 1911–1912. All of the universities have scholarships or loan funds for needy students, and it is common for benevolent persons to pay the expenses of promising young men without letting it be known where the money comes from.

The four regular college classes, Freshman, Sophomore, Junior, and Senior, formerly constituted distinct social groups of students who lived together for four years and came to know one another well. The hazing of new students by the Sophomores at the beginning of the school year, now abolished or ameliorated to a regulated mass struggle, served to draw the dividing line at the start and student sentiment opposed intimate association with the class next below or above. But the introduction of elective courses, the increase in attendance, and the fact that many students now complete their collegiate work in three years or enter the professional school before graduation have destroyed this class solidarity, although some universities, notably Yale and Princeton, have preserved as much of it as possible.

The question of housing for the students has become a perplexing one. In the older institutions the dormitories on the campus were inadequate for the increased attendance, and having been built in the days when "plain living" and "high thinking" were regarded as correlative, they did not provide the accommodation demanded by modern standards of comfort and hygiene. Private enterprise met the need by putting up outside dormitories, some of them quite expensive and luxurious, and the fraternities provided similar houses for their own members. But since this caused an undesirable division of the student body and emphasized class and social distinctions, efforts are now being made to bring the students together by erecting on the campus groups of residence halls, architecturally attractive and comparatively inexpensive. The halls of Princeton, Pennsylvania, and Chicago in collegiate Gothic, after the Oxford and Cambridge style, are good examples. With the same intent "unions" have been established which furnish club privileges for all students, such as the Harvard Union and Houston Hall in Pennsylvania. The Young Men's Christian Association buildings serve a similar purpose in providing rooms for society meetings and social intercourse. Large and handsome dining halls or "commons" have been erected in many places, for example, the Harvard Memorial Hall, Hutchinson Commons at Chicago, and University Dining Hall at Yale.

The fraternities, that is, student secret societies having a ritualistic initiation and designated by Greek initials, have become a very important factor in most American universities, and their benefits and evils are a topic of much discussion. Though including only a minority of the undergraduates in most cases, they lead in all social affairs and often dominate "college politics" as in the election of student representatives on various organizations. The annual class balls and "promenades," which have become in some places elaborate affairs filling several days and nights with festivities, are mostly in the hands of fraternity men, who give up their houses for the time to the out-of-town girls and their chaperones. Some of the fraternities lay emphasis upon scholarship, but on the whole the fraternity men are below the average of the nonfraternity men in their grades and are more often subject to suspension. With women it is different: those who belong to sororities have on the average as good standing in their studies as those who do not. In Princeton fraternities are prohibited, but the dining clubs have there developed into similar institutions. In Harvard such historic clubs as the "Alpha Delt" and "Porcellian" overshadow the fraternities. In Yale the chief aim of undergraduate ambition is the attainment of one of the three Senior secret societies, Skull and Bones, Scroll and Key, and Wolf's Head, composed of men who have distinguished themselves in the various activities of the college. In some universities (*e.g.* California) the Senior societies are held responsible for the good order and the tone of public opinion among the undergraduates. Here should be mentioned two honorary Greek letter nonsecret societies, to which a small proportion of the Senior class is admitted, — the Phi Beta Kappa and the Sigma Xi. The former, founded in 1776, chooses its members on the ground of high scholarship in the humanities and especially of literary ability. The latter, founded in 1886, is confined to the pure and applied sciences and takes into consideration chiefly capacity for original research.

The Young Men's Christian Association, composed of members of evangelical Protestant churches and associates, does much to cultivate a spirit of manliness, honor, and clean living. The association welcomes new students, helps them to find suitable boarding places, conducts devotional meetings and Bible classes, and provides rooms for social purposes, games, athletics, lunch, etc. The religious impulse among undergraduates at the present time tends mostly toward philanthropy and social service. The universities of Chicago and Pennsylvania maintain settlements in the congested quarter of the city, and Yale has a mission in China. The Young Women's Christian Association does a work similar to the Men's, but it is not so well equipped with buildings. Where Catholic students are numerous there is apt to be a "Newman Club." Some churches maintain "student pastors" or residence halls at the state universities to look after the welfare of the young people of the denomination.

The smaller denominational colleges often have strict regulations as to the conduct of their students. The large universities do not attempt officially to control the private life of the students, except in cases of notorious misconduct. Drunkenness and licentiousness are generally acknowledged to be less common than formerly. Classroom discipline has become unnecessary, and cases of intentional disorder, collective or individual, are rare, though sometimes there is a demonstration against an unpopular professor or a ruling believed to be unjust. In some institutions, notably the universities of Princeton and Virginia, the "honor system" of examinations prevails and proctors are dispensed with, but in larger universities with a less unified body of students it has been found impracticable to do away with supervision altogether, for when a prize such as a scholarship or admission to a profession depends upon the result, some are apt to succumb to the temptation to cheat, and students are extremely reluctant to report such cases as they may happen to observe.

Picturesqueness is imparted to campus life by the fondness of students for symbolism and celebrations. Any collective action accidentally inaugurated may, if repeated two or three times, come to be regarded as an established tradition of the institution and so to be maintained inviolate, however absurd or troublesome it may be. Processions and parades are a favorite form of demonstration, ranging from a spontaneous serpentine of lock-stepped students to elaborately planned pageants, often manifesting artistic skill as well as humor. Every college has its color (Harvard, crimson; Princeton, orange; Chicago, maroon, etc.), and classes, fraternities, and other societies are distinguished in the same manner. The cap and gown, recently established in American colleges, are worn only on state occasions, such as Commencement, but the college classes may often be known by some peculiarity of costume. Freshmen are in many places obliged by the upper-class men to wear green or black skull caps with a button on top. In the older universities alumni returning for their Commencement reunions adopt fancy dress for the campus or stadium parade, one class perhaps appearing as clowns, another as sailors, a third as Chinese, etc. The official ceremonies of the university are never interrupted as at Oxford, but are commonly parodied in the Class Day exercises. Organized cheering or "rooting" is a characteristic feature of all intercollegiate contests and student gatherings. The college or class yell has developed into a complicated rhythmic chant constructed with careful reference to phonetic values, and the students are drilled by cheer leaders in the art of delivering it effectively in unison. Students in all ages have been fond of song. The American songbooks consist of catchy airs of all sorts, some very old (*e.g. Gaudeamus igitur*, Three Crows, etc.), others picked up from the latest stage hits and sung with topical or nonsense verses. It is customary for the Seniors to gather in the evenings of their last week together on the steps of one of the buildings (*e.g.* Nassau Hall at Princeton) and sing together for an hour, giving place on the eve of Commencement to the Juniors. Class associations are maintained throughout life. At certain intervals, say, the quinquennial and decennial anniversaries of graduation, special efforts are made to get all the class together, and if a man is so far away that he cannot afford to come, his traveling expenses are sometimes paid privately from the class funds. At such anniversaries a class donation often of large amount may be raised for the university and a volume of statistics and biographical sketches published. The leading universities and colleges have local alumni associations (*q.v.*) in every large city, and at their annual dinners the president of the institution or some prominent professor is usually in attendance to report the progress of their alma mater and state its needs. The campus in many places takes on a military aspect in the afternoon, for in all the agricultural colleges and state universities receiving federal funds, drill and the study of military science are required of all male students for two years or more.

A new factor in campus life is the large number of foreign students, 5227 in 1912. The Japanese were the first to come from a distance; and later the Chinese came in larger numbers, owing to the remission by the United States government of the excess of the Boxer indemnity on the understanding that it was to be spent in educating young men in America. More recently the anti-British movement in India has sent many Hindu students to the United States. In order that they may be brought closely into the life of the country the students supported by governments or societies are distributed all over the country for their collegiate work, but they congregate in particular universities for advanced and professional studies. The dental school of Pennsylvania draws the largest number of students from South America and Australasia. The engineering schools of Cornell attract students from South America and China. The Japanese go chiefly to California and Columbia; the Canadians and Germans to Columbia and Harvard; the Hindus to California and Harvard; the Russians to Illinois. In universities where there is a large contingent from abroad cosmopolitan clubs have been formed, comprising all the foreign students and an equal number of Americans. These clubs are federated and affiliated with the European Corda Fratres and in several institutions have clubhouses of their own. E. E. S.

For more detailed discussion of the points here touched upon see the articles and reading references under the headings of ACADEMIC COSTUME; ATHLETICS; COLLEGES, AMERICAN; DORMITORIES; FRATERNITIES; RELIGIOUS EDUCATION; UNIVERSITIES.

For student life in English public schools see PUBLIC SCHOOLS; also BOY BISHOP; COCK FIGHTING; DORMITORY; FAGGING; GRAMMAR SCHOOL; PRIVATE SCHOOL. See also BACCHANT; BACCALAUREUS; CARMINA BURANA; DEGREES; GOLIARDS; HALLS; COLLEGE; and the articles on the leading universities.

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The best way to obtain a knowledge of the life in any American college or university is to consult the *Student Annual* and the files of undergraduate and alumni periodicals. There are many volumes of good short stories of college life which portray graphically and sometimes truthfully the spirit of the place.

STUDENT ORGANIZATION. — See Fraternities; Student Life.

STUDENT SELF-HELP. — See Student Life.

STUDENT SONGS. — See Gaudeamus Igitur; Student Life.

STUDENT TEACHERS, ENGLAND. — A technical term employed by the board of education of England and Wales to designate young men or women over seventeen years of age, suitable in respect of character, health, and freedom from personal defects, who have for three years preceding their appointment attended a secondary school recognized as efficient and who have passed the preliminary examination for the elementary teachers' certificate or its equivalent. Student teachers are after appointment assigned to elementary schools for the purpose of obtaining practice in teaching (for not more than eight periods a week) and observation. In addition they must obtain further general education to the satisfaction of an inspector of the board of education. Student teachers may be counted as part of an elementary school staff, but only for twenty children in average attendance. At the end of a year student teachers are eligible for admission to a training college or for recognition as uncertificated teachers.

See Teachers, Training of, under England.

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STUDENT VOLUNTEER MOVEMENT FOR FOREIGN MISSIONS. — An organization formed in 1888 "to awaken and maintain among all Christian students of the United States and Canada intelligent and active interest in foreign missions" and in other ways to promote missionary work. The watchword of the movement is "the evangelization of the world in this generation." The movement grew out of the International Conference of Christian College Students held at Mount Hermon, Mass., in 1886, and the definite organization was decided on at a meeting of college students invited to Northfield by Dwight L. Moody in the summer of 1888. The movement was incorporated under the laws of New York State and has a board of trustees and an advisory committee. The executive committee now consists of six members, a general secretary, an assistant secretary, an educational secretary, who forms and conducts mission study classes, and traveling secretaries. The aim of the movement is to act as an agency to recruit among the students in institutions of higher learning for foreign missions conducted by different denominations. The movement further develops interest in missions by publishing textbooks and pamphlets on the subject and collecting subscriptions for the missionary field. Several conferences of men and women are conducted, and one international convention is held every four years. Work has been done with young people connected with the churches and has led to the formation of the Young People's Forward Movement. Interest has been aroused among the different denominations, each of which has conducted special campaigns among the students of their body. In the colleges the movement frequently works hand in hand with the Y. M. C. A. and Y. W. C. A., and in conjunction with the Students' Y. M. C. A. it publishes *The Intercollegian.* The movement has spread throughout the world and is found in Great Britain, Germany, Australasia, India, and elsewhere.

Since the origin of the Student Movement 5194 young men and women, associated with it as student volunteers, have been sent from the United States and Canada to the mission fields. In 1910–1911, 34,006 students in 661 institutions were enrolled in classes for mission study, while $187,963.16 was contributed to the funds of the movement.

STUDENTS, AGE OF COLLEGE AND HIGH SCHOOL. — See Graduation, Age of.

STUDIES. — See Course of Study, Theory of; Colleges, American, section on Curriculum; College Admission Requirements.

STUDIES, COURSE OF. — See Course of Study, Theory of; Values, Educational.

STUDIUM GENERALE. — See Universities.

STUDY. — **Meaning of Study.** — The nearest synonym of study, as judged by common practice, is "memorizing." Other loose equivalents are "learning," or "acquiring," or "collecting facts," or "applying the mind." These terms, however, are merely descriptive of such study as commonly takes place in schools and are, naturally, as narrow as schoolroom practice. To obtain a reasonably broad conception of study one needs to look away from the schools to the methods followed by efficient workers in the various walks of life. There the most striking fact is the presence of a difficulty of some sort to be overcome, of a particular need to be satisfied, of a problem to be solved; in other words, the presence of a specific purpose as the motive for study. The scientific investigator illustrates this guiding purpose in the hypothesis that he sets up to prove or disprove. But the merchant illustrates it, also, when he considers what goods and how many he should buy; the real estate agent illustrates it when he tries to discover some way of disposing of a piece of property; the farmer illustrates it when he studies the best method of fertilizing his soil or of fattening his cattle. Any field of effort requires study and the first requisite in proper study is that it be purposive. The purpose, too, shall represent a real need of the person concerned, for it is the sole stimulus to energy for the hard work that is to follow.

Having set up such an object to be accomplished, there are several activities that must follow. One is the collecting of data that shall furnish the raw material for the solution of the difficulty to be overcome A second is selection from among the data collected, according to their value, for the object to be accomplished. A third is organization of the facts collected and selected, for without careful arrangement, or order, among such data, confusion is bound to reign.

The solution to the difficulty that is finally reached is only theoretical until it has been tested out or applied; consequently, the applying or using of the conclusions one arrives at constitutes another vital part of proper study. One cannot know when one is really master of a given difficulty, and therefore "through with it," until the difficulty is readily recognized and overcome, under altered conditions.

These five elements, therefore, are the main factors in proper study outside of schools; *i.e.* the setting up of a need or difficulty to master, the collecting of data, selecting from among them, organizing them, and testing them by use. The nearest synonym for proper "studying" is "thinking," and by such analysis of the term study we get some insight into what one is supposed to do when one thinks. It should be observed, however, that the word think is here used in an unusually broad sense, since it is made to include the using of ideas, which very often involves doing; the farmer must actually have fattened cattle successfully according to the theory that he has developed, before he has thought out, or studied, his problem sufficiently. Doing is thus included as an integral part of sound thinking, in this case, instead of being contrasted with thinking, as it often is.

It is easy to include other factors as essential to proper study, in addition to the five mentioned. Any scientific worker, for example, values an unprejudiced, open attitude of mind as so necessary to correct results in study that he is likely to include provision for such an attitude as among the prominent factors.

Again, entire freedom from subservience to others seems very important. Proper study always means independent study or the kind of study in which even the initiative belongs to the student. That being the case, provision for the exercise of such independence, so that the study may be a true expression of the self, can well count as a seventh important factor in proper study.

It is a question whether memorizing, by means of mere repetition or drill, should rank as an eighth element. The reasons for the doubt are found in the fact that when the other elements of proper study are well attended to, so much concentration of attention, association, and review of ideas are secured that separate attempts to memorize are usually unnecessary; the memorizing has been accomplished incidentally. If this is true, how perverted must be the prevailing study in the schools, where most of the time and energy of the student are consumed in the conscious effort to memorize!

Meaning of Thoroughness in Study. — From the preceding we get some idea of what is meant by thoroughness in study. Although demands for thoroughness are among the most frequent heard in the schoolroom, the crudeness with which that term is often conceived is indicated by two facts: (*a*) thoroughness of understanding is often confused with thoroughness of memorization as though the two meant much the same thing; (*b*) thoroughness frequently signifies *throughness*, or attention to everything, with particular emphasis on details.

According to the preceding, however, thorough study would be study in which provision was well made for the several factors composing good study. For example, the first condition of thorough study is that there be real purpose in the mind of the student so that the work he does shall seem to him worth while. A student has not thoroughly mastered a topic, then, if he feels indifferent to it. The topic, too, must not only seem to him valuable, but it must reveal its value in one or more specific problems or difficulties. Only when one has a specific problem or need does one make selection among facts, neglecting some and recognizing others as especially important. One reason why a large part of most study, so called, is nonselective is the fact that it is under the guidance of no particular purpose whatever.

Much more needs to be said on this question of thoroughness. But space will be taken here only to point out the several stages one needs to pass through in the thorough mastery of a subject. First there is the collection of the crude materials of knowledge. Second, selection should be made from among these, and the same should be organized. Third, these organized facts should be fused with past knowledge and feeling until they are assimilated, thereby themselves becoming experience. And finally, some portions must be converted into habit. There are thus as many as three, and often four, somewhat distinct steps or stages through which the student should pass in studying a topic. The fact that most of our studying does not extend fully through even the first stage indicates how incomplete studying usually is.

Kind of Study most Fitting in Schools. — Such a conception of study, particularly of thoroughness in study, necessitates very slow progress, and therefore a curriculum composed of few topics. Is it adapted, then, to use in school? The answer depends upon what the school is for. If the standard for the school is found in what most counts outside, and if, therefore, the thinking within the school is good only to the extent that it duplicates that which is found most effective outside, then there can be no doubt but that this conception of study and of thoroughness of study must hold for the school. It would be unfair to young people to allow them to do a kind of mental work at school radically different from and far weaker than that which they should do the moment they leave the school building.

Can Children Study? — A doubt may arise here, however, as to the ability of children to do the kind of studying suggested. Are they capable of setting up problems and of solving them as the educated adult does? Certainly they cannot set up and solve the *same* problems that the adult does. But who that has lived close to children can doubt that they are constantly confronted by difficulties? Living means with them what it means with adults, the meeting and overcoming of obstacles. And their study in school should be the kind that will make them more successful in their life outside. Possibly some persons may admit that high school pupils and perhaps those in the higher grades of the elementary school can really study, while they would deny such power to younger children. Yet, observe that complaints among teachers of children's bad habits of study begin to be frequent in the sixth and seventh grades of school. The wrong habits, therefore, must have been formed earlier, or in the primary grades. That locates the age when the greatest attention should be given by teachers to right habits of study, *i.e.* in the first few years of school.

In considering the ability of children to study, it should be remembered that the principles of psychology, being principles, are applicable to all persons, children and adults alike. A teacher in passing from the instruction of university students to that of ten-year-old children experiences no fundamental change of method. That being the case, the general method of study among children necessarily duplicates in outline that of adults.

Importance and Conditions of Teaching how to Study. — Any student of waste in education can easily reach the conclusion that the greatest source of waste is found in unintelligent methods of work by pupils.

Certainly one of our most needed reforms is found in this field. Yet much improvement in this respect depends upon the abandonment of three prevalent conceptions. One of these is the idea that childhood is mainly a period of storage, a period for collection of facts. This idea belittles the child's thinking or study.

The second, intimately related to the first, is the notion that the school periods should be occupied with reciting. Of all the terms used in connection with school work it would be hard to find any more suggestive of superficiality than the words recite and recitation. They indicate that the work of the pupil is chiefly to reproduce, to recall, rather than to reflect. But with a different conception of childhood and a different name for school periods — for example, thinking periods, or study periods — there is possibility of inculcating habits of work in elementary school children that will immensely increase their efficiency. The third change, however, that is necessary to this end is the conviction that the formation of habits, rather than the acquisition of facts, is the dominant purpose of the school.

Relation of Teaching to Studying. — It is common to assume that children learn how to study by imitation, through the instruction that they receive. And the argument is that, whether a teacher presents a given topic, or a child studies the same topic, the object to be attained in the two cases is the same, and the psychological process ought to be the same. The way to teach children to study properly, therefore, is to teach properly; and certainly much attention during recent years has been given to proper methods of teaching.

That all *seems* good enough; but facts reveal a fallacy somewhere in the argument — or in our method of teaching. For, by repeated tests the writer has discovered that experienced teachers will generally describe readily their method of teaching a subject, when they will hesitate and show much embarrassment when asked to tell how they themselves would study, or have studied, the same subject. They thus give strong indication that they do not consider the two methods identical. Again, the method of teaching has been studied so much that one often finds instruction that is considered good. Yet the studying by pupils is not often praised, indicating that, somehow, children's ways of working do not keep pace with the example set by their teachers. The tendency toward imitation, in short, proves insufficient. And, finally, the self-reliance necessary for intelligent, independent study cannot be acquired in any full degree by imitation, anyway; dependence on the teacher does not plainly lead to the exercise of independence.

Yet probably the original statement in this connection is valid, *i.e.* that the psychological procedures in teaching and studying must be substantially the same, when the two are sound. Assuming this to be true, we obtain here a very serious criticism of even the so-called good teaching of the present time. There is something radically wrong with it, since it fails to teach good methods of study.

One way of locating and overcoming the difficulty is for teachers to make a far more extensive study of their own method of study than they have heretofore made. The fact is that teachers, as a rule, are in their own work mainly mere collectors of the crude materials of knowledge. They are creatures of habit; and their methods are largely those carelessly acquired in childhood. The factors composing proper study, as enumerated in the earlier part of this article, are seldom illustrated by them in their own study; and if they were requested to show how those factors are involved in the study of ordinary school subjects, they could not do it. A far more intelligent method of study on their own part is therefore the first step necessary in establishing a better method among pupils.

Scope of this Problem. — Enough has been said, perhaps, to suggest that teaching and studying are very intimately related. And the latter is probably as broad as the former. Indeed, if we keep in mind that proper study includes independent exercise of initiative, as in the formulation of questions, the outlining of methods of attack on problems, etc., it may seem to some that method of study is even a broader subject than is method of teaching, in the ordinary sense.

There are a general and a special method of study, too, just as in teaching. That is, there are broad principles of study, such as are very tentatively outlined at the beginning of this article, just as there are general principles of method in teaching. And there are also as many special methods of study as there are special branches of knowledge, just as there are the special methods of teaching the different school subjects.

Factors in Proper Study as Standards for Judging Textbooks. — According to the theory of study that has been here offered, the center of interest is always a problem of some sort. The mere collection of data or of facts without reference to the solution of some question may be work, but it is not study in the proper sense of the term. The problem must be one that appeals to the learner, too, so as to be the basis for his estimating of values; and the various facts that are presented must be selected with reference to such a question, and organized around that center. In these requirements we have a valuable standard for judging the quality of textbooks in history, geography, and other subjects.

A textbook that is written from the point of view of the scientist, and that thus ignores the relationship of the subject matter to the purposes of the learner, is fundamentally poor. Most books attempt to touch the learner's interest at some points, to be sure; but the requirement here is that the text be built around practical questions that appeal to the pupil. Certainly there are very few books of this sort, outside of texts in beginning reading. Most of them would need to be rewritten entirely, to meet this test. Even aside from this essential, their organization is extremely faulty. Indeed, it is not at all uncommon for the texts that are used by eleven-year-old children to violate the simplest rules of composition, such as those children are held responsible for in their own written work from day to day. As one proof of this statement one needs to be reminded only that the marginal headings such as are found in many texts are usually prepared after, not before, the text has been written. Yet there is not one writer in twenty that can proceed clearly by "points," and make every statement bear closely on a given question, without having carefully worded that question in advance. These facts explain one of the difficulties in teaching children how to study, for the textbooks themselves too often tend to defeat that purpose by furnishing a bad example of thinking.

These Factors as Standards for Judging Curricula, and Methods of Teaching. — As has been stated, good studying or good thinking is that kind that has been found most effective in meeting the ordinary difficulties in life. It centers in a real difficulty, and pays due attention to organization, relative values, etc. According to this standard, a good study is, first of all, one composed of live problems; then due regard must be paid to organization of facts used for their solution, to their relative values, etc. And a good curriculum, as a whole, is one in which each branch of knowledge that is included meets these requirements. If the curriculum fails to do this, it thereby ignores the very habits of thought that we desire, by means of its subject matter, to inculcate in pupils. It would seem worse than ridiculous for a curriculum to show little or no regard for organization of its contents, when the habit of organizing ideas carefully is one of the aims of a school. Yet, strange to say, badly organized curricula are almost the rule, rather than the exception. Many makers of curricula assume that their work, somehow, is not subject to standards; and in taking that position they throw upon the classroom teacher the choice between overhauling the curriculum completely before presenting it, and presenting it without reference to good habits of study. The makers of our curricula are among the persons prominently responsible for the bad habits of thinking characteristic of pupils.

The teacher's method is responsible for meeting the same standards as the curriculum. For the two are means for the same ends, and only when the two illustrate forcibly the elements of proper thinking are the desirable habits likely to be established in the children.

The Point of View. — It is customary, in discussing instruction, to fasten attention primarily upon the teacher. It is the teacher's manner, the teacher's form of questions, the teacher's blackboard work, etc., that are referred to in books treating of instruction. In fact, most books for teachers are on the subject of teaching. That is a very curious fact, since the school does not exist for the teacher but for the pupil. It is, in fact, the pupils' activities in which we are primarily interested. For that reason, when a superintendent or a supervisor enters a classroom, his eyes should be directed first of all to the children themselves; and instruction *should be judged in terms of what the pupils do*, not in terms of the teacher's doings.

Emphasis on study — right habits of study — recognizes this position; it places the center of gravity of the school in the pupil. The extent to which we need a change in this respect is convincingly shown in the quantity of literature on teaching compared with the quantity on studying. The maxim, "As is the teacher, so is the school," has much truth in it; but it does not signify that the teacher is the "whole thing." The teacher may speak good English without securing good English from the pupil. So in very many other respects her example gives no guarantee of the results in the child. But since the child is by no means merely an imitator, anyway; since modern educational theory gives him an independent personality that is to be unfolded through education, the gaze of the educator should be riveted on the child himself. How he works is one of the prominent questions, and how he ought to work is another. Consideration of either of these questions means careful attention to his habits of study; and serious attention to both signifies a radical shift in viewpoint from that which now prevails.

F. M. M.

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STUDY PERIODS. — See School Management.

STUPIDITY. — See Dullness.

STUPOR. — The abnormal condition in which the mental processes appear to be suspended. This depends upon diminished attention or upon an inhibition of the mental processes, or upon a motor inhibition. That it is not always due to the lack of mental processes is indicated in those cases in which the stuporous condition is later explained by the individual as having been due to an inhibition of movement caused by fearful or frightful thoughts, which are later remembered and recounted. It is found as a symptom in many diseases; as in intoxication (*q.v.*), paresis (*q.v.*), epilepsy (*q.v.*), hysteria (*q.v.*), dementia precox (*q.v.*), mania (*q.v.*), melancholia (*q.v.*), and in idiots and imbeciles. It is related to catalepsy (*q.v.*) and to ecstacy. S. I. F.

STURM, JOHANN (1507–1589). — German educator, born at Schleiden in the Eifel district. After being educated with the children of Count von Manderscheid, he was sent to Liège to the school of the Brethren of the Common Life (*q.v.*). The organization and work here seem to have been impressed on his mind, for he was certainly indebted to the Brethren in his own organization at Strassburg. From 1524 to 1529 he was a student and then a teacher at the University of Louvain where he also assisted Rudiger Resch in printing a series of classical texts. Taken to Paris by his business affairs in 1529, he remained there and from 1530 to 1536 he lectured on the classics and dialectic. In the latter year he was invited to Strassburg as Rector of the new gymnasium. Through his relations with Martin Bucer at Strassburg, Sturm embraced the Protestant faith. His first task was to inspect the schools of Strassburg, and as a result he recommended in the *Ratschlag an die Schulherrn* (1538) the establishment of one big gymnasium with six classes, as at Liège. This scheme was adopted, but the courses in each of the two lowest classes extended over two years and the ABCdarian class also extended over the same period. In a very short time the school numbered 600 pupils. In 1567 the *lectiones publicæ*, or advanced course following the last class of the gymnasium, were recognized as a degree-granting academy with Sturm as *Rector perpetures*. The curriculum of the school was entirely classical, the end to be attained being *sapiens et eloquens pietas*, as Sturm stated in his program. But it tended to become a very narrow course in which the whole time of the student was devoted to rhetoric and style. Imitation of the classical orators, especially Cicero and Demosthenes, was the chief end desired. Livy and Homer received hardly any attention. Religion was not given the emphasis which might be expected, while the *real* subjects, although referred to in 1538, were not taught directly until 1565 and then through Greek and Latin texts. Sturm was in fact chiefly interested in style and rhetoric; to this end dramatic performances were introduced in 1565. Sturm's influence was very extensive and widespread, not only through his own pupils, but through his personal organization of schools and school systems; he drew up the ordinances of the school at Laningen (*leges scholæ Laninganæ*), and an old pupil drew up the Württemberg school ordinances (1559), which were copied in the Brunswick school ordinances (1569), which in turn were used as a model in the Saxon school ordinances (1580). In England his influence cannot be estimated, but it must have been great. Ascham (*q.v.*) was in regular correspondence with him and pays a great tribute to him in the *Scholemaster*. The Jesuits were probably indebted to some extent to the Strassburg school, although Sturm admits that he borrowed from them (*a nostris præceptis institutisque usque adeo proxime abest ut a nostris fontibus derivata esse videatur*). Sturm's strength lay in his ability as an organizer and as a master of rhetoric and style, subjects on which he lectured in the academy, the only teaching done by him. Sturm was a copious writer, and was the author of many textbooks and several educational works. His schoolbooks include: *Educatio puerilis linguæ* (a Latin grammar); *Neaniscus* (a Latin reader for beginners); *Onomasticon puerile Argentinense*; *Partitiones dialecticæ*; *In partitiones oratorias Ciceronis dialogus*; and many other books on style. Of interest for educational theory and practice are the following: *De literarum ludis recte aperiendis liber* (1558); *Nobilitas literata*; *De educatione principis*; *Epistolæ classicæ*; *Epistolæ academicæ*. The *De literarum ludis aperiendis* gives the plan of organization of the new gymnasium; beginning with a discussion of the value of knowledge and study, Sturm goes on to discuss the question of teachers and their salaries, the relation of parents to the school, the entrance requirements, the discipline and conduct of the pupils, and the provision of facilities for poor children. Then follows the organization of the school into classes, the whole course continuing from the age of seven to twenty-one. Sturm discusses the value of the division of pupils into separate classes, a system borrowed from the Brethren. The class divisions recommended in this program were not the same as those finally adopted. The curriculum and method of teaching in each class are discussed from the lowest to the last year of the academy. The last chapter is devoted to the teachers and the importance of their example for the pupils. In 1565 this program was revised in the *Epistolæ classicæ*, or instructions to the class teachers on the work of the respective classes. Sturm remained at the head of the gymnasium and academy until 1581 when he became embroiled in religious disputes and was compelled on account of "old age and other causes" to retire. He maintained a lively interest in the school until his death in 1589.

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STUTTERING. — See SPEECH DEFECTS.

SUBCONSCIOUS. — The term is a comprehensive designation for the status of manifold operations and relations participating in the mental economy that proceed under lowered conscious direction; in a more restricted usage it carries a variable implication that such procedures are more or less systematized and play a modifying or usurping rôle in the expression of the personality. In the normal mental life the distribution of consciousness presents degrees of intentness and explicitness conformable to a useful guidance of consideration and conduct. Functions achieve an awareness suitable to their urgency and need of deliberation or regulation. Acquisitions at first deliberate and conscious are, when habitual, carried on with reduced attention and control. The automatisms thus provided for in the very constitution of the psychophysiological endowment remain a standard condition of subconscious functioning. In typically complex mental occupations, the subsidiary, supporting, semimechanical processes are conducted with lowered oversight and bring their ordered issues unobtrusively, while the dominant consideration goes out to the reflective, novel, studious factors in purpose or situation. In terms of attention there is ever a focus and a margin, and the associational selection from the marginal areas of the next focal element conditions the progress and organization of thought and of thoughtful conduct. Subconscious facilitation thus becomes a standard factor of mental operations. The habit of mind thus formed appears in subconscious *impressionism*, the taking in with lowered and diffused attention of sensory stimuli and perceptive elements. The variable attention attitude necessary to incite orderly and purposeful conduct provides for a large range of subconscious actions.

The mental state, conditioned by the depth, variety, and distribution of consciousness, further conditions the train of thought as provided by the acquired mechanism, but finds its most significant issue in conduct. States of absent-mindedness furnish the largest and most domestic variety of subconscious procedures: acting on a suggestion without awareness of its source; an absorption in one mental area shutting out the awareness of another plainly available area; the unintentional performance of an undesired but habituated action; the confusion of parts of two actions or processes simultaneously or successively undertaken; the recurrence of older habits under altered and inappropriate surroundings; the similar misinterpretation of a situation but with a rectification before the response is formulated; — such are some of the formulæ of mental lapses illustrating the participation of subconscious procedures. In so far as they are organized and entertain a purpose, they bear the stamp of personal, individual behavior. They become fully matured and tend toward the abnormal under completer withdrawal of normal consciousness, and constitute the automatisms of sleep-walking, trance, hypnosis. It is possible to carry out a description of such handicapped states in terms of functions preserved, altered, or curtailed; such description will refer to the measure of receptive awareness and interpretation of the environment (incorporation); of the adjustment to the memory continuum and self-relations (orientation); of the sense of directive acceptance, assertion, or guidance of conduct (initiative). The partial and irregular retention or loss of one or more of these phases of mental operations illuminates such states as dreaming, somnambulism, hypnosis, trance, automatic writing, etc. The partial, and in part obscure, redisposition of mental function is significant in terms of the altered relations of conscious and subconscious factors. The fact that drug action will selectively and even capriciously induce these forfeitures, partial retentions, and irregular relations of normal privileges, argues for a definite, if unknown, rearrangement of nervous processes. There must be added the tendency for such departure from normal relations to fall back upon the freer, less controlled, associative stream, typically represented in dreams. The dream reservoir represents the subconsciously available (to some the suppressed) material, freed from selective domination. The more logical dream, the acted dream (somnambulism), represents the usurpation of a suppressed or submerged purpose exercised without arousing the usual conscious concomitants of directive action. Hypnosis represents a more artificial and extraneously suggested content for such elevation of subconscious procedures into conduct.

These abbreviated and inadequate formulæ suggest the variety of relation between conscious and subconscious factors in departure from their normal relation and on the way to the abnormal. The most striking and most fertile illustrations within the abnormal field are derived from hysterical states. (See HYSTERIA.) Here, as in the suggested anæsthesias of hypnosis, the fields of unawareness or disability, withdrawn from conscious direction, are accessible to subconscious stimulation and suggestion, and through these means may be reinstated in the normalized consciousness. Deepen and widen the gap in the relation, systematize the detached dominance, and there develop transitory states and the more tenacious conditions of dual or altered personality, — the complex culmination of disturbance in the relation of conscious to subconscious phases of the mental life, in such cases disruptive, and its successive dominances in competitive and destructive rivalry. Complexity still combines with the depth of the fissure; the reality or pervasiveness, the interference with normal functioning, with the scope and content of the rival mental lives. Detailed analysis again reveals that what is dominant in one consciousness is subconscious in another; what is withdrawn from one coördinated system is yet subconsciously present.

The above exposition is in terms of the subconscious as affiliated to normal procedure. The theory of the "subliminal self" takes a different view, and argues for a far more independent, even transcendent functional sphere for the "subliminal," and makes way for a psychology of different perspective than that currently recognized. (See Myers, *Human Personality*, 2 vols. 1903.) In very different temper such writers as Morton Prince, *The Dissociation of a Personality*, 1906, and Boris Sidis, *Psychopathological Researches in Mental Dissociation*, 1902, hold that the abnormal phenomena, particularly those concerned with functionally disorganized personalities, demand more intricate theories of conscious as well as subconscious relationships. The extent and complexity of the realm of the subconscious give place to legitimate variations in interpretation, which do not detract from the recognition of the comprehensive rôle of subconscious procedures in modern psychology. J. J.

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SUBJECT. — A term used to express the reality, or conception, to which the predicate of judgment refers. Following the grammatical analogy, the logical theory of judgment was first built up on a subject-predicate basis. From the first, however, there was an attempt to penetrate below the mere linguistic distinction and find some ultimate traits corresponding to it. Upon the whole, two methods have been pursued. According to one, the ultimate object of knowledge is always an individual, an individual being defined as that capable of existence on its own account. These individuals have adjectival qualities and relations, which, when stated, form the predicate. The essential trait of the predicate as distinct from the subject is thus that it cannot exist alone but is always attached to a real individual. The above view is, in effect, the Aristotelian, which was embodied in the scholastic logic. It identified "subject" and "substance." There were difficulties about the genuine reality of individual physical things as exhibited to sense perception; and even in Aristotle there is another strain according to which not the individual, but the form or universal, as manifested in the particular, is the true object of knowledge. Exaggerated emphasis upon the individuality of the subject was the logical basis of scholastic Nominalism, as like emphasis upon the universal nature of the object of knowledge was the source of "Realism." In general, the way out was at least suggested by Aristotle. Individuals were regarded as forming a graded series of hierarchical classes, from sensible physical things through human souls, higher spiritual essences up to divine spirit, — a class with a unique member. These classes were regarded as objectively real. Thus they were at once universal as regards the particulars included within them, and individual in virtue of the objective unity of the class. When particulars were known, it was really this inclusive generic unity which was known, as, for example, we know a table by recognizing the class character of table it manifests.

The other way of interpreting the subject-predicate distinction is that of modern idealism. The subject is the ultimate reality known; the predicate is an ideal meaning referred to this reality as its qualification. Absolute reality and true knowledge alike imply the synthetic unity of world and mind, thing and meaning, object and self. Thus there is, therefore, a hierarchical system of judgments, according to the degree of the qualification of reality by ideal meanings, going from superficial sense perception up to self-consciousness (*q.v.*) as the highest reality and truth, in which reality as subject and ideal meaning as predicate completely interpenetrate each other. Thus the goal of judgment is reached; knowledge and being become one.

Upon the whole the modern tendency of logic is to substitute a general relational theory of judgment for the subject-predicate theory. The influence of mathematics has been of chief importance in this regard, for there seems to be no sense in distinguishing subject and predicate in a proposition expressing an equation or other mathematical function. All the terms seem to be on the same level, and judgment seems to consist simply of the statement of the relation that connects them. This theory is now being developed as the logical basis of Neo-realism. Relations and terms (or things, elements, existences, and subsistences or essences) both exist equally in objective nature, and are independent of and "external" to each other. Knowledge itself is simply one of the external relations into which things may enter without being affected thereby. This movement is still too new to exhibit the method by which it expects to avoid the difficulties that have beset every system of atomistic pluralism from the metaphysics of the Megaric school to that of Herbart.

Those who deny that the subject-predicate relation is the proper form of judgment or knowledge treat it as either a purely linguistic or a merely psychological matter. As psychological, the subject stands for the term that happens to come first to mind, or for that which is best known and best established in a particular individual's mental history. The predicate expresses the term that happens to suggest itself later in time, or else that which is new to the individual and still in process of learning and assimilation. The distinction, in other words, is wholly relative to the individual's growth in knowledge, having nothing to do with the realities known.

In regard to the subject-predicate distinction, like many others, pragmatism (*q.v.*) attempts to mediate between the idealistic and the realistic theories. It starts with the principle termed merely psychological by Neo-realism, namely, that the subject stands for the old and established in knowledge, the predicate for the new and still growing. It interprets the logical distinctions of individual and general, existential and ideal, which have been embodied in the classic theories of judgment from this standpoint. But it holds that the growth of knowledge is not merely psychological, but real. There is a genuine reconstruction of the old through its qualification by the new. This conception of judgment is assimilated to the biological process of readaptation in growth, knowing being

accordingly treated as this process of organic readaptation brought to intentional control.
J. D.

For SUBJECT in another of its meanings see SELF.

SUBJECTIVE. — A term used in antithesis to objective, to describe all those states and qualities which belong to the inner life of the individual. Thus, a vibration of luminiferous ether is an objective fact, while a sensation of light or a sensation of color is a subjective experience. An emotion may be described as a purely subjective state, since it has no external parallel.
C. H. J.

SUBLIMINAL SELF. — See PSYCHICAL RESEARCH; SUBCONSCIOUS.

SUBNORMAL CHILDREN OR DEFECTIVES. — See EXCEPTIONAL CHILDREN.

SUBSIDIES. — See APPORTIONMENT; HIGH SCHOOLS, SUPPORT OF; NATIONAL GOVERNMENT AND EDUCATION.

SUBSTITUTE TEACHER. — See TEACHER.

SUBSTITUTIONAL METHOD. — In correcting the habitual errors of pupils two methods are employed: (1) an inhibitive method, or (2) a substitutional method. The former lays the emphasis upon making the child conscious of his error, and stimulating him to self-restraint and self-correction; the latter upon focussing his attention on a parallel or competitive mode of achieving the same end. The inhibitive method depends on the power of the child to resist the well-worn path of least resistance and consciously to outline the modified channel of action along which the appropriate response is to issue, until practice makes it perfect. The substitutional method aims at the establishment of a totally new mode of response that has as little as possible in common with the former ineffective memorization or habit. The substitutional method seems best in the correction of very stubborn habits or in the correction of ordinary errors or inefficiencies possessed by young children who have not yet attained a large power of inhibition and conscious self-direction. The efficacy of the substitutional method depends upon the foresight and control of the teacher more largely than the inhibitive method, which is capable of self-application in larger degree. Thus, children who stutter are not practiced in inhibition and conscious correction, but are taught to overcome the habit by singing words containing the troublesome letters. A cramped handwriting is made free, not by trying to modify the finger action, but by using an extremely different attack, the whole arm movement, developed first through full round rhythmic exercises and later through letters and words.
H. S.

See CORRECTION OF ERRORS, METHOD OF; HABIT.

SUBTRACTION. — Of the four fundamental processes of arithmetic, subtraction is peculiar in the fact that the world has come to no general agreement as to how the operation should be performed. Even the language of the process is unsettled, since a business man would say, "Deduct what I owe and hand me the balance" or "hand me the rest." He would not say, "Subtract what I owe and hand me the remainder." Even in the schools the word *subtraction* has not been universal. Fibonacci (1202), for example, uses *extract* instead of *subtract*, and Cardan (*q.v.*) uses the best term of all, *detract*. A name that for a long time seemed likely to conquer was *subduction* (from *sub*, under, and *ducere*, to lead, subtraction coming from *sub* + *trahere*, to draw, drag, take). Thus Ramus (1569) uses this term; and Schonerus, his editor (1586 edition), uses both *subduco* and *tollo*. Digges (1579), in his English arithmetic, says: "To subduce or subtray any sũme, is wittily to pull a less frõ a bigger nũber." Such terms as diminish (*diminuere*), *cavare*, *tarre*, *abate*, and *deduct* have also been used.

Even where subtract was common it is a curious fact that for nearly three centuries the spelling *substract* was generally used, and it is found among comparatively illiterate people even now. Thus in a work by Clichtoveus (1503) *substractio* is used, although *subtractõne* and *subtrahi* also appear. The explanation seems to be that the Latin *sub* becomes either *sub* (*soub*) or *sous* in early French, and that *subtractio* becomes *soustraction*, and also *soubstraction* (as in Savonne's work of 1563). Hence in the early French works, and even in the Latin arithmetics printed in Paris about 1500, the *s* crept in. From France it passed over to Holland, so that we have *substractio* in the Latin works published there. It also went over to England and became the common form until the nineteenth century, both there and in America.

The unnecessary and difficult words *minuend* and *subtrahend* are adaptations from the Latin *numerus minuendus* (number to be diminished) and *numerus subtrahendus* (number to be subtracted). It would be better, in teaching, if we might use the original phrases to-day, or adopt some of the other phrases that the world has generally used, such as "the higher and the lower number," "the upper and under," "total and less," "total and abatement," and "debt and payment." Such changes in general customs are not easily made, however, and can only come slowly as the sense of the people realizes the wisdom of abandoning common forms. The word *remainder* has never been popular, and is rarely used outside the school to-day. The words *rest* and *balance* are the common terms of business, and the former was long used in the schools. We have also had such words as *resta*, *reste*, *remaynder*, *remaynes*, *remainer*, *reliqua*, *residual*, *relictum*, and *difference* used quite generally, and, as already stated, we have even yet by no means settled upon the best term in our language.

The process itself has undergone many changes. A few illustrations will serve to show the efforts that have been made to settle upon something that will command the support of the business world as well as the school.

1. *Complementary Subtraction.* — To subtract 8 from 13, we add the complement of 8 (that is, $10 - 8$) to 13, and then take away 10. The method is very old, being found in Bhaskara (*q.v.*), in the popular work of Riese (*q.v.*), and in the first printed arithmetic (1478). It had some standing in this country owing to the fact that it appeared in the popular arithmetic published by Pike late in the eighteenth century. It is the method of cologarithms used to-day.

$$\begin{array}{rr} \underline{13} & 13 \\ 8 & \underline{2} \\ & 5 \end{array}$$

2. *Borrowing and Repaying.* — In this example we would say: "$4 - 9$ is impossible, so we *borrow* 1 from the tens; then $14 - 9 = 5$; we now repay the 1 by adding it to 3, and have $12 - 4 = 8$." The expression "to borrow" came from the use of the abacus (*q.v.*). This was and is one of the most popular plans that the world has known, and in some respects it is the best of all the methods from the standpoint of the computer. It appears in such well-known works as those of Widman (1489), Riese (*q.v.*), Cardan (*q.v.*), Recorde (*q.v.*), Cocker, and Sfortunati, not to speak of hundreds of later arithmetics.

$$\begin{array}{r} 124 \\ \underline{39} \\ 85 \end{array}$$

3. *Simple Borrowing.* — In this example we would say: "$14 - 9 = 5$, $11 - 3 = 8$." This has become somewhat more popular than the preceding one because it is slightly easier to explain, although computers generally find the other the more rapid. The method is an old one, appearing in the works of Rabbi ben Ezra (early twelfth century), who recommended beginning at the left and looking ahead to take care of the borrowing. The left-to-right plan was common in the Orient in the Middle Ages, and it had as prominent an advocate as Ramus (*q.v.*) in Europe.

$$\begin{array}{r} 124 \\ \underline{39} \\ 85 \end{array}$$

4. *The Addition Method.* — This consists in finding the number that must be added to the smaller number to make the larger one. It is also called the making-change method, and because it was used extensively in the Austrian schools in the nineteenth century it often goes by the name of Austrian method. In this example we would say: $7 + 6 = 13$, $9 + 5 = 14$, $1 + 1 = 2$, writing the 6, 5, and 1 in the proper places. The plan is not so old as the others already described, but it is found in the works of Buteo (1559) and a few other sixteenth-century writers.

$$\begin{array}{r} 243 \\ \underline{87} \\ 156 \end{array}$$

The educational question involved is easy to state but difficult to answer: Which is the best of these methods for use in the schools? If the test were to be the ease of explanation by the pupil, one answer would be given; if it were to be the usage of parents and of the general public, another answer would be forthcoming; and if it were to be speed and accuracy, there would be still another reply. Each method can be sufficiently explained, for no explanation is very serious. If we were really serious in the theory we would not say that "$4 - 7$ is impossible," since the result is -3 and since we could carry on subtraction in arithmetic as we do in algebra, by the aid of negative numbers, if we chose so to do. The question of explanation may, therefore, be dismissed as not a serious one, particularly as we are coming to recognize that there is little value in having a child repeat analyses of this kind. Experience seems to favor the addition method on the ground of speed and accuracy, but it is handicapped by the fact that parents are not generally familiar with it and distrust innovations that are not unquestionably for the better. It seems probable, therefore, that this method must gain ground slowly, but that it stands a good chance of becoming the common one in time. The difference in speed for the ordinary citizen who is not a technical computer is not so great as to cause him to champion a method that he did not learn as a child, and hence the question is not likely to be settled speedily. D. E. S.

SUCCESSION OF SCHOOL SUBJECTS, ORDER OF, IN THE TIME SCHEDULE. — See School Management.

SUETONIUS (GAIUS SUETONIUS TRANQUILLUS). — Roman advocate and author, born about 75 A.D. He was private secretary (*magister epistolarum*) to Hadrian, but was dismissed in 121 and spent the rest of his life in literary activity. Suetonius wrote the *Lives of the Cæsars* (*De vita Cæsarum*) from Julius to Domitian; biographies of famous men (*De viris illustribus*), dealing originally with poets, orators, historians, philosophers, scholars, and rhetoricians, but of these only a few of the lives of the poets (*De poetis*), scholars (*De grammaticis*), and rhetoricians (*De rhetoricis*) are extant. While these works show no historical insight and are mainly rhetorical exercises, they are valuable contributions to our knowledge of Roman life. Entirely lost is an encyclopedic work, *Pratum* or *Prata*, which was probably one of the sources from which Isidore of Seville (*q.v.*) drew.

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SUGGESTIBILITY. — See Suggestion.

SUGGESTION. — In the more specific sense, suggestion refers to the influencing of another's thoughts or actions by the intrusion of ideas, which arouse no effective resistance, and leave the subject with the feeling of supplying the initiative to his conduct. Such suggestion may be carried to almost any extent, may be simple or complex, direct or indirect, and even unintentional. The term acquires meaning with reference to the self-assertion or initiative of the normal state, in virtue of which we claim our thoughts and actions as our own. Any marked lowering of this directive guidance, any weakness of will or assertiveness, and yet more markedly any temperamental complacency opens the door to suggestion, which in turn will be successful just in proportion on the one hand to the slightness of the resistance which it meets and on the other to that which it offers through the natural acceptability of its content. The mind off its guard, or indolently disposed, yields to suggestion; or again, with reference to tempting situations its natural suggestibility leads to acquiescence, while equally contributory to the result is the disposition of the subject, the measure of his instinctive conformity, his tendency to passive obedience or compliant acceptance. The factors are all present in the "forcing" trick of the sleight-of-hand performer who offers a group of cards from which any one is to be chosen, but at the very moment of choice deftly gives a favorable position to the one he wishes to be selected. The thing must be done quickly; the chooser is likely to be a little flustered, and the act arouses little motive for self-expression. Persuasion as a form of suggestion must be similarly used. The appeal must be subtly addressed so as not to arouse antagonism; it must woo and win, not command and defeat; it must not impose but only imply the desired issue, leaving the latter free to follow from the presentation as the natural result of the subject's own reflections and motives.

Suggestions in the normal sphere are thus either more distinctively illustrative of the *modus operandi*, the make-up of their appeal (an elaborate instance is the speech of Antony over the body of Cæsar); or illustrate the natural conformity of the response to the suggestive influence (such at the simplest is the contagion of a yawn or a laugh); or illustrate the uncritical reaction of the subject (as instanced below); or approach one of several forms of abnormal suggestibility, due to the increasing waning of resistance through any one of a variety of complex influences. Clearly the commoner and more normal varieties of suggestion are intrusive and indirect. The very manner of asking a question may determine the answer; and even more definitely the confidence aroused in the hearer towards the speaker. The experiment of tossing a ball toward the ceiling once, twice, three times, and at the fourth time going through the movements of tossing while really concealing the ball, when performed before a class of children unsuspicious of any deception, will always result in a large percentage of affirmations that the ball was seen to go up towards the ceiling at the last throw. Any awkwardness of manner or any explanation that will arouse the critical attitude will usually interfere with the result; though in the presence of the highly suggestible it may be done as crudely as you please and still prove effective. The *Aussage* test (*q.v.*) illustrates various modes and degrees of like suggestibility. Violent suggestions that would be rejected by the prompt exercise of the logical faculties, or improper ones that would either offend the ethical impulses, or even merely violate social etiquette, will certainly prove ineffective in any normal state, or at least will prove so until they succeed in breaking down the barriers which they meet. But the abnormal varieties of suggestion imply the abeyance of these corrective factors, and may accordingly be quite direct; indeed they may require a strenuous enforcement of manner in order to induce the very acquiescence, the yielding of control, upon which their successful issue depends. Hypnotic suggestion is the typical form of abnormal suggestion. When hypnosis is completely established, the correction that would come from inner logic and outward evidence is abolished; the personal resistance due to ethical and social habits is in abeyance; and the very intensity of the mental field resulting from the shunting of the normal reactions, increases the abandon and realism of the hypnotic conduct, which is indeed the unresisted acting out of the implanted suggestion. Hypnosis is thus a state of suggestibility abnormally intensified by the curtailing of the normal resistance. To illustrate briefly, if I tell a friend that a blank piece of paper is a bank note, he trusts his alert senses and not my word; but the hypnotized subject has been rendered blind to all but what is brought to his notice and sees the blank paper as a bank note. The former, if invited to appear with his coat worn inside out, would obviously refuse; the latter obeys, and obeys because the sense of impropriety of the action is suppressed. In allied states of sleep, somnambulism, the approaching and receding stages of anæsthesia, there is also a diminished assertiveness and direction and a consequent increased suggestibility.

Suggestibility thus finds its field wherever a noncritical attitude is natural, and still more markedly where a complacent or obedient conformity is established. The word of a doctor, in matters of health, counts for more than that of a relative; while the emotional state, the desire to accept, to be influenced, is most important. In this view autosuggestion, which emphasizes the personal attitude, in the first instance as exercised by firm intention, by intensified desire, conviction, determination, is but the clearing of the obstructions for the free action of desirable or desired suggestive influences. The action of remedial measures from bread-pills to homeopathic doses, to faith in patent medicines, or in manipulations or formulæ, are all instances of autosuggestion in which anticipation brings its own fulfillment. By the same principle the convinced believer in spiritualism elaborates a shrouded figure into the precise image of a departed relative. In such instances objective plausibility may be slight just because the subjective acquiescence is so complete; and it is complete through the quiescence of the critical faculties. Any lowering of the latter, such as fatigue, a favorable prejudice or anticipation, the contagion of a crowd (for the independence of a group is always less than that of its constituent individuals), strengthens suggestibility and renders it open to cruder, more direct appeals, with affiliation to the abnormal status; it does this just because the indirect, subtler intrusions that disarm suspicion need no longer be cautiously applied. The two seemingly opposed formulæ thus are closely allied. In football phraseology, the normal suggestion goes around the ends, the more abnormal "bucks" through the center, finesse, no longer necessary, giving way to command.

J. J.

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SUICIDE AMONG SCHOOL CHILDREN. — This psychosis among children has been rather extensively studied in France, Germany, and Russia. Apparently the number of cases among school children has increased in recent years; and in Russia, at least in the higher schools, it is estimated that the percentage is greater than among the general population. While there is usually a neuropathic basis, the occasion for suicide has been found in a large number of cases to be some condition connected with the school work — punishment, especially when unjust, worry, discouragement from a difficult task, repression, or the like. Proal in a careful study of suicide among French school children finds results that emphasize the enormous power of suggestion, and especially autosuggestion which comes from the belief of the child in his own power or lack of power. The subjective conviction that one can overcome difficulties or, on the other hand, mistrust of self and discouragement, have an extraordinary influence; especially does the thought that one is doomed by inheritance to a fate of this kind. The same investigator finds that suicide is often suggested by reading, and he not only emphasizes the need of wholesome literature but condemns books that give a pessimistic view of the world and the newspaper custom of giving detailed accounts of suicides. The investigations of suicide are also of general significance, showing the grave danger of unsympathetic methods of teaching, of unjust punishment, and of any method which is negative, distinctly inhibiting and discouraging. The function of the school is the direction of motor and mental activities, only in rare cases inhibition; and usually the latter is not only unpedagogical but distinctly unhygienic.

W. H. B.

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SULPICIANS, OR THE SOCIETY OF SAINT SULPICE. — See Teaching Orders of the Catholic Church.

SUMATRA, EDUCATION IN. — See Netherlands, Colonies of, Education in the.

SUMMARIES. — See Reviews.

SUMMER CAMPS. — See Camp Schools.

SUMMER SCHOOLS AND CONTINUOUS SESSIONS OF UNIVERSITY AND COLLEGE. — From the earliest period of university activity, provisions have been made for work supplementary to that formally organized and recognized as constituting the institution itself. (See Universities.) With the university, as with all other social institutions, the accepted functions tend to become fixed in customary lines of activity which in time fail to respond to new needs, or serve inadequately the existing demands. Hence from time to time it becomes necessary, as with all educational institutions, to readjust the work of universities.

The particular occasion of the summer

session is found in recent times in two conditions: first, that the expensive plant and the professionally trained staff were left with a longer period of inactivity than was needed personally, or was justified socially; and, second, that the session of the higher educational institutions conformed so closely to that of the lower schools that the great class of professional people who would be most likely to avail themselves of university opportunities, and had most need of them, were prevented from so doing.

The summer session in American institutions has excellent antecedents. As early as 1840 Ralph Waldo Emerson and A. Bronson Alcott proposed a summer school which more than a generation later was actually realized in the Concord School of Philosophy and Literature (*q.v.*). Meanwhile other educational innovations had appeared all contributing towards the establishment of a permanent summer session as we know it now. The most important of these so far as its direct relation to the university is concerned was the organization of field work in the various sciences. Extensive work of this character was begun at Harvard as early as 1869. That directed by Professor Louis Agassiz of Harvard in the early seventies on Buzzards Bay may be called the first of the University Summer School. A fund of $50,000 was given in 1872. In 1874, two years following the first formal effort of Professor Agassiz, Professor Asa Gray initiated a summer school of botany. Both of these were short lived; but they were soon followed by other efforts of a more permanent character. It was not until 1888 that the present Marine Biological Laboratory at Woods Hole was established. Two years later a similar laboratory was opened by the Brooklyn Institute (*q.v.*) at Cold Spring Harbor, L. I. All such schools appealed only to a small number of highly specialized students. Other schools, such as the Concord School (*q.v.*), which first organized in 1879, appealed only to groups of special students. In 1874, however, a new movement was initiated, destined to enroll students by the tens of thousands and to demonstrate the permanency and the generality of the demand for organized intellectual work during the summer vacation period. This was the Chautauqua Assembly (*q.v.*), which since that day has had very numerous imitators. The summer session of universities and colleges was established by gradual growth. Harvard University furnished the best, and with the possible exception of one or two isolated cases in special subjects, as that of the University of Virginia in law beginning 1870, also the first. To geology and zoölogy, Harvard added chemistry and botany in 1874, physical training in 1887, French and German in 1888, physics and engineering in 1889. Most of this work has been affiliated with the Lawrence Scientific School, but from the nineties it became a general university enterprise. Meanwhile other institutions had followed, offering work especially for teachers. Beginning in the University of Wisconsin in 1887, this work at first was under the auspices of the State Teachers' Association though given in the university buildings. Cornell University announced its summer session for teachers in 1892.

At the present time summer schools are conducted by most of the leading universities and by many of the colleges. The *Report* of the United States Commissioner of Education for 1911 shows 497 institutions as holding summer sessions. Of these, 280 do not accredit the work thus given towards degrees. This list, however, includes normal schools, kindergarten schools, Y.W.C.A. and Y.M.C.A. training schools, schools of music and of dramatic art, schools for the training of librarians, schools of handicraft, etc.

Summer Schools in Europe. — The summer meetings held in the universities of Great Britain are a continuation of the work of the University Extension departments during other parts of the year, and of the National Home Reading Movement. In other words, these summer sessions are more of the character of the Chautauqua assemblies. For the character and extent of this work see the articles on UNIVERSITY EXTENSION and on the NATIONAL UNION OF TEACHERS. These meetings last for a few weeks, consist for the most part of public lectures, and are attended by about a thousand students, mostly women. The work does not constitute any component part of the university course.

The summer school of the University of Edinburgh began in 1896 as university extension under the auspices of "The Town and Gown Association." Hence it bears more the nature of a local Chautauqua.

On the continent, formal work is offered at a few French, Swiss, and German universities, chiefly for foreign students. Practically all of the work is designed to assist foreigners to master the native language. This work began at Paris in 1894 under the auspices of the Alliance Française founded in 1893 for the purpose of extending the French language. The courses offered are very popular and attended by large numbers, chiefly foreigners. Other universities, especially Grenoble, are popular centers of such work. The University of Geneva in Switzerland has carried on a similar session since 1892. In Germany, Göttingen and Marburg offer similar work.

Continuous Sessions. — One of the most scholarly of the leaders of the Chautauqua movement (*q.v.*) was responsible for the permanent grafting of the summer school idea on to the university. Dr. William R. Harper, becoming the first president of the University of Chicago, gave the idea a unique embodiment, one which yet remains the ideal with but few imitators. From the first this university has organized its work into four quarters, of three months each, the summer session not differing in any essential feature from the others. While this feature has not been approximated as yet by any of the older institutions, it is being imitated by normal schools and other educational institutions and remains as the type of the logical outcome of the summer school idea.

In favor of this plan it is to be said first of all that experience has proved that it meets a real and widely felt need, and that in actual trial it has worked well. At no time in the history of the university which first applied it has the question ever arisen of its discontinuance. From the first, the arrangement contemplated distinctly: (1) The admission of students at four times of the year instead of only one. (2) Provision against loss of time by students who fall sick or are otherwise interrupted. (3) The possibility for those who are physically able, and for whom it is approved by their college advisors, to complete their undergraduate work in fewer than four calendar years. (4) Provision whereby students may be absent from the university during certain portions of the year during which they can, to the best advantage, occupy themselves in securing means to continue their courses. (5) The providing of a year or two years' vacation for instructors, with full salary. (6) Making it possible for the university to use, besides its own instructors, the best men of other institutions, both in this country and in Europe. (7) Provision for the use of the university plant throughout the entire year instead of during three quarters of the year. (8) Furnishing an opportunity for professors in other institutions, teachers in academies and high schools, ministers and others, employed during the conventional school period of the year, for pursuing college and university studies at a period when they are released from their professional work.

Against the plan of continuous sessions, involving graduation at the close of each quarter, it has been urged that it tends to destroy "class spirit," and therefore to be unfavorable to general college spirit. Experience seems to show that this opinion is valid, but in reply it is urged that the advantages of the plan very much more than offset this disadvantage, and that there are ways of counteracting this tendency. Moreover, as the novelty of the arrangement has worn off, its influence in the direction indicated has been less and less consciously felt. It is further suggested in objection to the plan that it involves an excessive demand upon the teaching force of the institution. In the larger and richer colleges and universities it is practicable to arrange a rotation of instructors whereby different members of a given department take their vacations in different portions of the year, and, further, it is always practicable to secure from other institutions, both in this country and abroad, eminent men who give instruction in the summer session. This is particularly the case since the summer session as it is now being described is divided into terms of six weeks each, within which period "minor" courses may be completed, and in some cases "double minors."

The plan described has been in continuous operation in the University of Chicago since its opening in 1892, and while it has been adopted more or less completely in several other American colleges and universities, it does not appear that the work is organized in any other institutions entirely on the plan above outlined.

Statistics. — However, it is proper to include here mention of the summer work of institutions which, while they do not offer literally continuous sessions, nevertheless offer in short summer sessions work organized like that of other sessions of the year, and leading to degrees. Among these are Cornell, Columbia, Indiana, Harvard, Michigan. These figures illustrate the extent of the demand for the summer or continuous session: —

The University of Chicago, consecutive years from 1894 to 1911, inclusive: 597, 931, 1048, 1237, 1434, 1636, 1674, 2375, 2246, 2223, 2225, 2273, 2268, 2605, 3050, 3246, 3336, 3248.

Columbia University, consecutive years from 1900 to 1912: 417, 579, 643, 940, 914, 976, 1008, 1353, 1498, 2632, 2973, 3602.

Cornell University, consecutive years from 1906 to 1911, inclusive: 642, 755, 841, 889, 987, 1029.

Harvard University, for the year 1874, 45; 1879, 70; 1884, 25; 1889, 188; 1894, 425; 1899, 636; 1903, 1186 (N.E.A. Year); 1904, 825; 1909, 857; 1910, 933; 1911, 873.

Indiana University: 1890, 31; 1895, 195; 1900, 333; 1905, 590; 1910, 1137.

University of Michigan (law courses), consecutive years from 1902 to 1911 inclusive: 1902, 45; 1905, 103; 1910, 131.

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See Index of Periodical Literature for numerous current references.

SUNDAY SCHOOLS. — History. — The Sunday school is a distinctly modern institution. Before the period of popular education there were infrequent, isolated attempts to provide regular instruction in religion for youth on Sundays; but the organized institution of schools, under the direction of churches, to teach religion to those who would otherwise be without this instruction belongs entirely to the late eighteenth and early nineteenth centuries. Since this school is a religious institution, however, it has deep and far-reaching roots; the principles which determine its existence can be traced as far as human records go. In the few attempts that have been made to write the history of the Sunday school it has been customary to follow an imaginary line back through monastic teaching, early Christian assemblies and the Jewish synagogue schools to instances of instruction in the Old Testament and to such injunctions as that given in Deut. 6 : 7–9, 20–25 as well as to Assyrian and Egyptian customs. None of the instances cited ever describes a Sunday school; they all indicate the normal educational activities, which were usually religious either in content of study or in intent, or they refer to special sacerdotal or theological instruction. The Sunday school is a special institution developing under the stimulus of educational progress, fostered by the churches and designed to give that systematic instruction in religion which the agencies of general education do not provide. A Sunday school may be defined as an institution organized by a religious body for the education of youth in the religious life and holding its principal periods of instruction on the day of rest.

Beginnings of the Modern Sunday School. — The Sunday school was born of two significant modern movements: on the one hand, the humanitarian awakening which gave new attention to child life and led to the popular extension of elementary education; on the other, the remarkable revival of religion which found its best-known expression in the Wesleyan movement. It came into being at the beginning of American independence, in the period of the French Revolution, when the condition of the masses provoked Malthus's *Essay on Population* (1798), and religious conditions gave rise to Paine's *Age of Reason* and Paley's *Evidences.* An awakening social and religious consciousness found itself just as the augmenting wave of popular education began to take form. The educational method began to find a place in religious enterprises. The founders of Bunyan's Meeting House, Gravel Lane, Southwark, London, established a charity school in the basement of that building in 1687. (See CHARITY SCHOOLS.) Griffith Jones (*q.v.*) established 3395 schools in Wales between 1737–1761 in which 158,288 persons of all ages learned to read the Bible in Welsh. Kindermann, in Bohemia, in 1773, established a school for children, meeting in his church on Sundays. Hannah Bell gathered children in a parish church at High Wycombe, near London, and taught them the Bible. She organized this school with rules and called it a Sabbath school. This work begun in 1769 constituted the first organized English Sunday school. (Joseph Cole, *Memoir of Miss Hannah Bell*, rev. ed., London, 1839.)

On the western side of the Atlantic more important events were happening. The prophetic " charter of free education " had been adopted by the Massachusetts General Court in 1647; popular education was soon to become the settled policy of many of the colonies. Even though the elementary schools taught religious subjects freely the American churches felt an additional educational responsibility. There are numerous accounts, often impossible to authenticate, of gatherings on Sunday of children for formal instruction in churches: as, 1665, Roxbury, Mass.; 1674, Norwich, Conn.; 1676, Plymouth, Mass. (See a lengthy list in *Yale Lectures on the Sunday School*, H. Clay Trumbull, New York, 1904, p. 112.) In 1737, giving a schedule of his Sunday appointments at Savannah, Ga., John Wesley mentions " the catechising of the children at two." The meetings of Wesley, Whitefield, and Asbury everywhere attracted large numbers of children. The churches received many youthful members. New life in religion and new interest in childhood led many churches scattered through the colonies to establish classes for instruction in religion. Since the Bible was used in the day schools the work in these classes was largely in the catechisms.

Robert Raikes (1736–1811) is called " father of the Sunday school." Important as was his work, he neither invented the religious instruction of children nor originated the present-day Sunday school, though he became its first great propagandist. Like others before him he gathered together destitute children to instruct them on Sundays " in reading and the church catechism." In 1780 he began with the children employed in the pin factories in Gloucester. He employed four women as teachers, paying each of them one shilling a Sunday. In his paper *The Gloucester Journal* he published, in 1783, an account of this school. Later he printed and circulated a pamphlet urging the advantages of such schools. This led to similar experiments, particularly in the Northern manufacturing districts. In 1785, in coöperation with William Fox, he organized " The Society for promoting Sunday Schools throughout the British Dominion." The rules of the Society included: " Be diligent in teaching the children to read well. . . . Neither writing nor arithmetic is to be taught on Sundays. . . . Avoid as much as possible corporal punishments." Writing in John Wesley's *Arminian Magazine*, of January 1785, Raikes calls his schools " Sunday Charity Schools." Hannah More (*q.v.*) wrote in 1789 to William Wilberforce a request for books for her schools in Cheddar. In 1796 " The Edinburgh Gratis Sunday School Society " was organized to conduct Sunday evening schools. At the death of Raikes there were many schools in all parts of England. They were all for destitute children, designed primarily to give the rudiments of general education and usually conducted separately and independently of churches. As late as 1869 an act of Parliament exempted "Sunday and ragged schools" from the rates. Their principal importance is due to the fact that "The Sunday schools established by Mr. Raikes . . . were the beginnings of popular education" in England (Green, *Short History of the English People*, New York, 1896, Vol. II, p. 359). While Robert Raikes was working in the north and west of England, William Fox, a Baptist deacon, was endeavoring to interest his brethren in London in a plan by which "all the children of the poor might receive a scriptural education by being taught to read the Bible." He corresponded with Raikes, and in 1785 their efforts resulted in the organization of the Sunday School Society. The British and Foreign School Society (*q.v.*) was organized in 1808 to establish elementary schools in which an "undenominational religion" should be taught. The Hibernian Sunday School Society was organized in Dublin in 1810. Rev. Thomas Charles, of Bala, Wales, converted many of the schools organized by Griffith Jones into schools on the Raikes plan, but meeting in churches. He included adults in his schools.

The propaganda of Raikes was soon carried to North America, and at Philadelphia, in 1791, "The First-Day or Sunday School Society" was organized, designed to give elementary instruction to needy children whose condition seems to have been little better than those to whom Raikes ministered. This society, however, avowed a distinctly religious purpose. But conditions in the United States were generally very different from those in Great Britain. There was less need for separate schools on Sunday for destitute children; there were more educational opportunities, and already the churches were beginning to meet the need for religious instruction. Many churches regarded the Raikes type of work, conducted under nondenominational or "union" auspices, as an invasion of their rights. (See records of this controversy in *Important and Remarkable Epochs in History of S. S.*, Edwin W. Rice, Am. S. S. Union, Philadelphia, 1905.) Doubtless this increased the sense of responsibility on the part of the churches and helped to bring about a distinctive type of organization in the United States, namely, Sunday schools created and maintained by the churches as well as meeting in church buildings. The schools in England met with the opposition of the clergy; they were separately maintained, being regarded as charitable attempts at general education, and they were not generally recognized as integral parts of church organization and service until after the middle of the nineteenth century. In the United States the school has always been a church institution. In 1790 a Methodist conference at Charleston, S.C., formally placed the schools under the churches and ordered the establishment of "Sunday schools in or near the place of public worship" with two sessions each Sunday, two hours in the morning and four in the afternoon. Nearly all the denominations in the United States trace their first schools to the last decade of the eighteenth century.

Development of the Schools. — The Sunday schools have seen their most remarkable development in the United States. Increased in a little over a century from a few scattered schools in 1800 until in 1906, according to the U.S. Census, there were 178,214 schools, of which 165,128 were Protestant. Of all church organizations in the United States 79 per cent reported Sunday schools. While the average membership per church organization was 157, the average enrollment per school was 82. (Bureau of Census, *Special Reports, Religious Bodies*, 1906, Vol. I, Washington, D.C.). The statistics of the International S. S. Association include only "evangelical" churches. The latest figures, for 1911, covering North America only, are: 160,225 schools in the United States, 10,642 in Canada, total, 170,867, with nearly 14,000,000 pupils in the United States, 853,065 in Canada (statistics of the International S. S. Association, June, 1911, in *Organized S. S. Work in America, 1908–1911*, Chicago, p. 150). In 1910 comparative statistics show 12,777,739 pupils in the United States; 733,125 in Canada; 6,649,320 in Great Britain. (*World-Wide Sunday School Work*, *Report* of World's Sixth Sunday School Convention, Chicago, 1910.) In all of Europe outside of Great Britain there were (in 1910) less than 3,000,000 pupils enrolled; in all of North America outside the United States there were less than 1,000,000 enrolled. The statistics for all Protestant "evangelical" schools throughout the world in 1910 were: schools, 285,999; officers and teachers, 2,607,371; pupils, 25,403,823. This is an average enrollment of 98 per school. Sunday school statistics cannot, however, be relied upon, since the method of reporting is not sufficiently careful.

The Sunday school also developed in the past century from an unorganized institution, in which groups of children were taught their catechism or were trained in reading from the Bible, to a recognized institution of the church in which, in at least a large number of instances, children are grouped in classes approximating to public-school gradation and are given a regular graded curriculum in religious history, literature, and, frequently, ethics and Christian duty; and from single groups meeting where they might to an institution often requiring special buildings and employed officers. The early and steady development of schools in the United States is due to: (1) The adoption of the school by the church in the United States. This school was early recognized as a part of the organization of the church, a method of its work. This was due to the leadership of the church in early colonial life; to the non-necessity for separate schools for destitute children; to the increasing necessity for special agencies for instruction in religion on account of the diminishing attention given by public educational agencies to this subject. In this connection, note the action of the General Conference of the Methodist Church, 1824, establishing schools and the early creation of special denominational Sunday school machinery. (See Michael, O. S., *The Sunday School in the Development of the American Church*, pp. 63, 77, and 91). (2) Greater emphasis on the voluntary principle in American life, making this institution with its unpaid workers more normal to the life of the people. (3) In the degree that the Sunday school in the United States became the sole agency for the direct religious instruction of the young, the need for more carefully trained workers and more efficient organization was increasingly felt. This school had a heavier burden to bear here than in any other country. It received a larger measure of criticism. Its peculiar function in the United States, especially its unusual position as a voluntary institution brought about a higher type of efficiency and a closer approximation, markedly in recent years, to educational ideals.

The American Sunday school was fostered in its beginnings by special organizations. Early in the nineteenth century informal conferences on the problems of the schools led to the formation of numerous local societies and associations for the promotion of schools and for their improvement. The scattered societies were federated in 1817 in " The Sunday and Adult School Union." This society carried on missionary work, organizing new schools and creating subsidiary societies in different states. Denominational organizations to foster the schools followed. The Methodist Episcopal general conference in 1824 passed resolutions ordaining schools, and three years later the Sunday School Union of this church was organized in New York. The Unitarian Sunday School Society and the Lutheran Sunday School Society were organized in 1830, the Congregational Sunday School and Publishing Society in 1832, and others in the years immediately following.

The various Sunday school societies at once called conventions in which states and groups of states united. The first national convention was held in New York in October, 1832. A resolution was passed that the Sunday school " should embrace all classes of the community," a significant departure from the Raikes plan of schools for the destitute. At the Fifth National Convention, April, 1872, the plan of uniform lessons for all schools was adopted. An International Convention, including Canada, was held in 1875, and the form of organization became that of an International Association with provision for carrying on work in the interim between conventions. The functions gradually assumed included the selection of lessons for schools, the promotion of teacher training, the organization of state associations, conducting institutes and conferences, and the development of different departments of the school. The Religious Education Association, organized in 1903, took active interest in the work of the Sunday school and particularly urged the application of educational principles. It published much literature on improved methods and encouraged important experiments. The Interdenominational Sunday School Council, consisting of representatives of the various Protestant denominational Sunday school and publishing societies, was organized in 1911 to secure denominational coöperation and to effect better correlation of their work, particularly as to the publication of lesson material for schools.

The Sunday school curriculum developed very slowly. At first the Bible was used for teaching reading, and catechisms were used for memoriter work. In 1785 Raikes prepared a little textbook called *Redinmadesy*. Teachers gave prizes to pupils who memorized large numbers of biblical verses. Gradually the Bible became the subject of study; in 1810 James Gall of Edinburgh prepared lessons consisting of Bible stories. In 1827 a list of questions on biblical lessons was prepared by Albert Judson, and question books were issued by the American Sunday School Union. Separate schools prepared more elaborate schemes of lessons, and Sunday school organizations published them in book form, while others were printed in religious journals. In 1866 John H. Vincent began to publish in " The Sunday School Teachers' Quarterly," four series of lessons. Edward Eggleston also published a series in his paper, *The National Sunday School Teacher*. In 1869 the fourth National Sunday School Convention introduced a plan of uniform lessons for all pupils and appointed a committee to prepare the same. From 1872, when this committee first reported, up to 1900 the so-called " uniform " lessons were in use in nearly all Protestant Sunday schools. The " Uniform " scheme provided for a loosely arranged and unsystematic series of biblical lessons sometimes maintaining literary or historical consecutiveness for six months and sometimes for a year. The lessons were selected for these periods alternately in the Old and New Testaments. The plan was to cover the more important portions of biblical study in either six- or seven-year cycles. It was formally adopted by the British organization in 1873. It was never wholly satisfactory. The Unitarian schools never accepted it. In 1874 the general Diocesan Commission of the

Protestant Episcopal church was appointed to prepare suitable lessons for episcopal schools. The Friends early developed special lessons, as did also the Lutheran Church and naturally the Hebrew schools and those of the Roman Catholic church. In 1888 Rev. Erastus Blakeslee began the preparation of a new series of Sunday-school lessons which, as they were later developed and improved, contributed very largely to the adoption of graded lessons. In 1894 the International Primary Union asked the International Association for a course of lessons specially prepared for children under six. In 1902 the International Lesson Committee prepared a two years'course for young children, but the convention failed to authorize graded courses for adults. In 1905 the lesson committee of the International Sunday School Association was instructed to prepare courses for adults, but this instruction was not carried out. Later developments were the introduction of lessons on temperance, adopted after much difficulty in 1890, missionary lessons under the influence of the Young People's Missionary Movement in 1907, and extra-biblical material provided in the graded courses adopted in 1908. Meanwhile many schools had been following independent courses in church history, missionary heroes, doctrines, and ethics. The school was no longer distinctly and exclusively a Bible school but had become a school of religion. In 1908 after a stormy period of debate and agitation, during which many schools had adopted graded curricula of their own, the International Association authorized its lesson committee to prepare a completely graded course of lessons in addition to the uniform lessons. One of the factors leading to the general adoption of the principle of gradation in lessons and to the extension of curricula beyond the Bible is the work of The Religious Education Association which from 1903 on steadily urged lessons selected on the basis of the child's developing life.

Depending almost uniformly on voluntary teachers, the Sunday school found the problem of securing a sufficient and efficient corps a most serious one. New York City Union advocated the training of teachers in 1827. Dr. W. E. Channing of Boston in 1837 urged "an institution for training men to train the young," and this was made particularly to apply to Sunday schools by Dr. D. P. Kidder in 1847. Rev. John H. Vincent in 1857 organized a Normal School in Joliet, Ill. (S. Gilbert, *The Lesson System*, New York, 1879). The first regular institute was held at Galena, Ill., in 1861; the next in Detroit, and very soon institutes became numerous. J. E. Gilbert, a public school principal of Buffalo, published in 1865 a monthly paper of lessons for training teachers. In England the South Bucks Sunday School Union advocated "normal schools" for Sunday school teachers as early as 1857 (*One Hundred Years for the Children*, S. S. Union, London, 1903, p. 102), but it was not until 1856 that a training class was organized in London. In 1870 the London Sunday School Union appointed three examiners who should prepare tests and examine teachers as to their biblical knowledge. At Chautauqua, N.Y., a Sunday school assembly for training teachers was organized in 1874. The Illinois Sunday School Association in 1889 undertook the organization of numerous classes for the training of teachers. Later, other states took up the same work until nearly all the state organizations were engaged in teacher training. In 1903 the International Sunday School Convention organized a department of teacher training with a special secretary. The different denominations have promoted the training of their teachers, employing secretaries and publishing textbooks. More recently courses have been offered in the universities and colleges for the training of teachers and directors of Sunday schools as well as for the preparation of ministers in Sunday school work. Notable instances of these courses in religious education are found at Yale University, University of Chicago, Washburn College, and Baker University. Drake University has a department of religious education with full professor in charge. (See Cope, "College Leadership in Sunday school Efficiency" in *World-Wide Sunday School Work*, 1910; also reports on Teacher Training Commission of Religious Education Association in *Religious Education*, April, 1912.) The Theological Seminaries also offered professional training for Sunday school workers. The Southern Baptist Theological Seminary established a chair of Sunday School and Religious Pedagogy in 1906. Other notable instances are: Hartford Theological Seminary, with its special School of Religious Pedagogy for lay workers; Divinity School of the University of Chicago; Union Theological Seminary; Chicago Theological Seminary; School of Theology of Boston University; Garrett Biblical Institute; Episcopal Divinity School of Philadelphia. Many seminaries require this work for graduation. The educational standard of the Sunday school had advanced sufficiently by 1910 to lead a number of churches to adopt a rule to employ only teachers who have completed some form of training course.

Parallel to the improvement in teaching is the development of organization. At first schools were only small groups of children gathered promiscuously under one or more teachers. When numbers made it necessary to divide a school the pupils naturally gravitated into large age groups. Under the stimulus of conventions the main attention was at first given to increasing the number of schools and to recruiting the membership of each. Early convention programs also indicate the serious problems of disciplining large unorganized groups. The beginnings of better organization came with the separation of the very small children into a primary department, and the organization of their teachers into Primary Unions in different cities. The first Union was organized in Newark, N. J., in 1870. Special treatments of the uniform lessons were prepared for this department consisting of children up to and including nine years of age. Then when the lesson publishers issued special "quarterlies," cheap textbooks on the lessons for children of the years ten to sixteen, these pupils were also grouped into what was called the Intermediate Department. Provision was next made for a "Beginners' Department," corresponding to the kindergarten years. In 1903 an adult department was officially organized. In the same year the International Sunday School Association adopted the plan of dividing all classes into these departments: Beginners (the years before the public school); Primary, three years; Junior, four years; Intermediate, four years; Senior, four years; and Adults. This, however, was only a rough classification of pupils. Two important books appeared about this time, *Principles of Religious Education*, by President Nicholas M. Butler and others (Longmans, New York, 1900) urging the application of educational methods to the Sunday school, and *Principles and Ideals for the Sunday School*, by Professors Ernest D. Burton and Shailer Mathews (University of Chicago Press, 1903), setting forth the authors' experience in the Hyde Park Baptist Sunday school of Chicago, under the superintendence of the President of the University of Chicago, William Rainey Harper. This school with many others in different parts of the country was seriously attempting to make the Sunday school an educational institution adequate to modern demands. Much of the recent progress of Sunday schools is due in no small degree to the pioneer work of this school and certain others, particularly St. John's, Providence, R.I.; First Congregational, Winnetka, Ill.; First Presbyterian, Buffalo, N.Y.; and to the school at Teachers College, Columbia University, afterwards transferred to Union Theological Seminary. Meanwhile the Religious Education Association persistently urged the exact gradation of pupils corresponding to public school experience and the separate administration of the departments.

The development of the school calls for increasing physical equipment. The early Sunday school met in private rooms, public halls, taverns, and later in the vestries and small rooms of churches. The pioneer Sunday schools of North America met in the log schoolhouses and in many settlements gave birth to the first churches. Then the schools, in both city and country, met in the church auditoriums which were used both for opening worship and the instruction of classes scattered about the room. It was a long time before any church provided a special building for the school. One of the first was the First Methodist Episcopal of Akron, Ohio, erected in 1867, which provided for a main assembly room with ten classrooms surrounding it and a balcony, also having ten classrooms. A model Sunday school building was exhibited at the World's Fair in Chicago in 1903 and a small schematic model at the Child Welfare Exhibit, New York City, 1911. Many churches erected Sunday school buildings, some entirely separate and some as a part of the church edifice. At first the essential features of such buildings were one large room with independent rooms for classes, but later construction provides for independent assemblies of departments with entirely separate classrooms equipped with blackboards, cabinets for museum material, libraries, and other apparatus. In a few instances such buildings are equipped with gymnasiums, game rooms, lockers and play rooms.

Up to nearly the end of the nineteenth century the Sunday school was almost entirely ignored by the agencies of public education simply because it had never taken seriously its own function of religious education. In 1903 the Religious Education Association was organized to inspire religious forces with the educational aim and the educational forces with the religious aim. From the beginning it paid especial attention to the work of the Sunday school and secured the coöperation of recognized authorities and experts in educational science who gave their services freely to the problems of the Sunday school. The workers in this organization prepared outlines of curricula, plans of organization, and materials for teacher training, and promoted work in experimental schools as laboratories. They brought new factors of educational power to the life of the Sunday school so that the ten years before 1912 saw greater progress in the development of this institution than the forty years previous. The association especially urged the training of ministers and Sunday school workers in psychology and education. It urged the employment of professional leaders. In 1907 the First Presbyterian Church of Buffalo employed a paid director of religious education to organize all the educational life of the church. There had been a few paid superintendents prior to this in other churches. In 1912 there were about fifty directors of religious education in the United States.

Sunday schools have developed on the continent of Europe but slowly, and principally under pressure of missionary endeavor. The first Sunday school in France was organized at Bordeaux in 1815. In 1864 the Continental Mission for Sunday schools was organized in London. In 1911 there were 9000 schools in Germany, 1200 in France, 372 in Italy, and

884 in Russia. Sunday schools are maintained on all the missionary fields, usually in connection with the mission stations and churches and fostered by the Foreign Sunday School Association. (See *World-Wide S. S. Work*, p. 242). The first Sunday school in India was organized July 9, 1803, at Serampore, by William Carey and his associates. (*The One Hundredth Year*, S. S. Union, London, 1903, p. 194.)

In the Catholic Church. — The educational history of the church is that of the development and application of its principle of the sacred obligation of every parish priest to prepare every child for the proper reception of the sacraments of the church, and of ecclesiastical responsibility for the control of general education. On this ground it maintains parish schools in which Christian doctrine and the Bible are integral parts of the curriculum. In the degree that formal religious education is thus given in the day schools the Sunday school is unnecessary, yet a large number of parishes have provided for the regular instruction of children on Sundays. This is naturally the case where numbers of their children attend the public schools in which no religious instruction is given. The encyclical of Pius X, (April 15, 1905) on the teaching of Christian doctrine, orders that "all parish priests, and in general all to whom the care of souls is committed, must teach the catechism for the space of one hour on all Sundays and holy days of the year without exception to their young boys and girls. . . ." The organized school is not common, but classes are taught on Sunday in practically every parish.

The United States Census of 1906 reports 11,172 Catholic Sunday schools for approximately 12,000 churches and 3500 chapels, with a total of 1,481,535 pupils. This probably includes the enrollment in their 4364 parochial schools. While the number of Catholic Sunday schools is not great, it is evidently increasing. [See *The Sunday School Teacher's Guide to Success* by Rev. Patrick J. Sloane (New York, 1908); *The Sunday School Director's Guide to Success* by Patrick J. Sloane (New York, 1909); and *The Catholic Sunday School* by B. Feeny (St. Louis, 1907).] The material of study is always the official Catholic catechism and occasionally Bible history. The catechism is graded for three classes, for beginners, middle classes, and advanced pupils. In Catholic high schools, academies, and colleges, a full and thorough course of apologetics and Bible studies is given.

Jewish Sabbath Schools and Sunday Schools. — The modern Sabbath school in connection with the Jewish synagogue is a direct descendant of the synagogue schools. It owes its success to the spirit which founded many independent schools for elementary education on the continent of Europe in the eighteenth century, and it flourishes where there are no separate day schools for Hebrew children. The first Hebrew Sunday school was founded in 1838 in Philadelphia by Rebecca Gratz at the Mikvah Israel Congregation. Later schools were organized in Charleston, S.C., Virginia, and Cincinnati, Ohio. In 1847 some schools were organized in Berlin by the Reformed Congregation. In 1876 the Jewish Association for the Diffusion of Religious Knowledge was organized in London. By this time the Sabbath school had become a regular institution of the congregations in America, but schools were working independently until in 1886 the Hebrew Sabbath School Union of America was organized. In 1909 the generosity of Mr. Jacob H. Schiff provided for the training of Sabbath school teachers at the Hebrew Union College in New York. (See Rabbi Grossman on "Jewish Religious Education" in *Religious Education* for August, 1911. On the Sabbath school in general see *Jewish Encyclopædia*, New York.) No authoritative statistics have been collected for Jewish schools. The United States Census of 1906 shows 600 Hebrew Sunday schools, rather less than one school to every three congregations; 192 of these meet daily, including the Talmud Torah schools with employed teachers. Four hundred and two hold more than one session a week. Rabbi Schanfarber, of Chicago, estimates that in 1912 there are approximately 1100 synagogues in the United States, each having either a Sunday school or a Sabbath — Saturday — school and many having day schools also. In Chicago the seventy-five synagogues enroll nearly 6000 pupils in either Sunday or Sabbath schools. Notable examples of advanced methods in Jewish Sunday schools are in Temple Emmanu-El, and in the Free Synagogue, New York.

Other Religious Organizations. — The general adoption of the Sunday school in Protestant churches has led to the use of similar institutions by almost all religious bodies. The Latter Day Saints or Mormons had (1906) in the United States 766 Sunday schools with 113,139 pupils. The Mormon church maintains many elementary day schools in Utah. The Reorganized Church of Latter Day Saints reported (1906) 302 schools with 16,946 pupils. Local organizations of the Ethical Societies conduct Sunday schools, some of which are notable for educational efficiency. These schools generally accept the aim of character development, though sometimes depending wholly on instruction in morals (Walter L. Sheldon, *An Ethical Sunday School*, London and New York, 1900).

Educational Status of Sunday Schools in the United States. — Church schools (parochial schools and Sunday schools) are to be regarded as a second main division of the American educational system, the first division being the schools of the state. (See RELIGIOUS EDUCATION.) Not until recently have even the leaders of Sunday school education begun clearly to think of their work in this way; yet the logic of our history and of our political institutions has thus wrought in the Sunday school movement in this country almost from the start. A free church, self-sustaining both financially and educationally, is a correlate of the modern secular state. The parochial school and the Sunday school have a common religious impulse, and each is a method of ecclesiastical self-perpetuation. But there is an important difference between the two. The Sunday school movement as a whole is an effort to coöperate in education with the state, but without any kind of divided support, control, or administration on either side. The parochial school, on the other hand, proceeding from an assumption that only the church is competent to teach the children of the church, refuses, as far as its own pupils are concerned, to divide the work of instruction with the state. But teaching the secular branches as well as religion is so costly that a desire arises for a state subsidy. A logical consequence of such a subsidy would be divided authority within the schools of a church. Now, all such mixed support and divided authority are contrary to the principles and the practice of Sunday schools. In fact, these schools are the first large (even if crude) expression, on the ecclesiastical side, of the educational consequences of a rigorous "free state, free church" policy. They are, therefore, first of all, a unique experiment in educational organization and administration. If any of the larger religious bodies, or if any influential group of religious bodies, succeeds in the present effort to develop Sunday schools into a satisfactory system of religious education, a momentous contribution will be made not only to religion, but also to our political experience. An appraisement of present Sunday school conditions, therefore, should contribute to a just appreciation of the general educational situation in the United States.

Courses of Study. — The forward movement in Sunday schools has focussed its attention chiefly on the idea of gradation of pupils and of lesson material. "Gradation," however, is not a sufficient description of the principle that underlies the new graded curricula. Rather, the whole conception of the material of instruction is being vitalized. The movement is a reaction against the old assumption of the primacy of a static body of ideas that religious instruction is merely to hand on to the young. This assumption is fundamental alike to the International Uniform Lessons, and to the partly graded Blakeslee Lesson System. In both cases a lesson cycle, whether of three or of six or seven years, is not a cycle of child growth but simply a rounded whole of biblical material divided into sections to fit a calendar of years and Sundays. At the end of such a cycle the pupil was supposed to know the Bible or at least certain parts of it. One cause of dissatisfaction with this system is the discovery that, in general, there is appalling ignorance of the Bible on the part of those who have traversed the whole of such a cycle once or even several times. The reform movement proclaims that the child's present interests and religious capacities must govern the course of study. Several results follow, all of which appear in one or other of the graded systems. (1) The order of the biblical material is no longer governed by either the literary arrangement of the Bible, or the chronological arrangement of the historian, or the logical arrangement of the theologian. The lessons for certain years are of course historical; those for other periods, literary. For still other periods the order is freely topical, or it may be governed by a systematic analysis of a subject. (2) This free selection, which implies that the Bible is merely an instrument for promoting spiritual life, naturally leads into freer handling of the material that is selected. Such freedom in teaching is a necessary corollary of free development and free self-expression on the part of the pupil. The material of instruction has to become fluid in order to enter into the child's flowing experience. Mental and moral assimilation consequent upon a (from the pupil's point of view) free trial-and-error method — this is a fundamental, though not generally expressed, point of view of graded lesson systems. It appears in two characteristics of the new lessons: the choice of points of emphasis (as using the stories of Jesus' miracles not to prove a dogma concerning the person of Christ but to make his compassion seem beautiful and attractive), and stimulus to the formation of individual judgments of value on the part of pupils with respect to biblical persons and events. (3) The results of historical and literary research in the Bible are beginning to be utilized. This is an inevitable, as it is also an admirable, consequence of the determination to treat the Bible as a means for spiritual growth rather than as a static mass of ideas that are to be merely transmitted. While it is not true that graded lessons have been demanded, as some have supposed, chiefly as a means of spreading the higher criticism of the Scriptures, it is unquestionable that the old uniform lessons were deliberately used by leaders of the system as a means of perpetuating precritical views. (4) The course of study now ceases to be exclusively biblical. Material is to be chosen, whatever the source, that will most effectively promote the pupil's growth toward Christian manhood or womanhood. This principle has always been followed to the extent that the catechism or the prayer-book has been studied; but now the assumption is made that no *a priori* limits are to be placed upon the sources of teaching material. Nature studies, imaginative stories (including fables and myths), church history, the life of a missionary, the work of a philanthropist, non-Christian religions, a study of morals, methods of church work, analysis of social forces in a community, a study of the duties of the Christian as a citizen or as a home maker — each of these appears in one or more of the new courses. To determine the proportion of biblical to extrabiblical lessons is a practical impossibility, however, because the new courses have departed from the notion that a curriculum can be constructed by the juxtaposition of "subjects of study." Is a topical lesson that uses biblical material a study of the Bible or not? Indeed, nothing more clearly shows the educational advance made by these lessons than the fact that any such classification of them as biblical or extrabiblical is impossible of rigorous application.

There are differences, that need not here be specified, between the several graded systems. One is more largely ecclesiastical in tone and method, another more distinctively biblical; one introduces extrabiblical material with greater freedom than another; one is more free than another in its treatment of biblical criticism, of miracle stories, or of dogma — all of which is to be expected. The adoption of graded lessons has been unexpectedly rapid. Though general statistics on the point are not available, the movement is certainly not premature. There is every reason to expect that it will go forward until graded lessons, chosen and handled on broad educational principles, are practically universal.

The Training of Teachers. — The advance movement encounters no other problem as serious as that of securing competent teachers. In a few isolated instances professionally trained day-school teachers are employed and paid. More churches are likely to seek a solution in this direction. But it is useless, for the present, to think of any general abandonment of the traditional voluntary, unpaid teaching. The practical question is, can a competent force of unpaid lay teachers be developed and permanently maintained? The difficulty has long been recognized, but the seriousness of it was covered up by the use of ungraded lessons. For here the assumption was that the teacher's business consists in giving an exposition of a Bible passage, and making an application of its "lessons." The mechanical simplicity of this scheme made possible the "lesson leaf," a sheet put into the hands of the pupil from week to week or month to month with the text of the lesson, some notes, some questions on the text, and a set of applications printed on it. These leaves gave support to the vicious system of teaching that created them. It was essentially a weakened form of preaching, consisting of exposition, moralizing, and exhortation. Under these conditions undue emphasis came to be placed upon the teacher's personality, or upon a supposed natural gift for teaching, or upon "spiritual power," and entirely inadequate recognition was given to the possibility of intelligent skill. The most widespread effort to help teachers with their work was the teachers' meeting in which the lesson for the next Sunday was discussed or lectured about. Here stands revealed the central fault of the whole system, the assumption that teaching consists in transferring to the pupil's mind a predetermined, static material. It is true that leaders here and there labored in summer assemblies, institutes, conventions, and classes, to bring sound methods to Sunday school teachers. In the nature of things, however, no training could possibly correct the faults inherent in the lesson system. "Do the wrong thing, but do it right," was implicit in such training. With the graded lessons there arrives for the first time the possibility of a general and effective system of teacher training. For, in the first place, the separation between material and method is now overcome. The lesson is now a process to be accomplished in the pupil's mind, and the material of the lesson when it reaches the teacher's hands is already cast in the terms of the pupil's experience. In the second place, it now becomes possible for the teacher to capitalize his experience by teaching the same series of lessons in successive years. Whereas under the old system the teacher (at least the teacher of pupils above eight years old) commonly went on with his class from year to year indefinitely, under the new plan he specializes within a given grade or, at least, department. At the present moment we are in a nascent stage of teacher training. During the three years 1908–1911, about 180,000 persons in the United States, or one eighth of the officers and teachers of schools affiliated with the International Sunday School Association, were enrolled in training classes. Nearly 27,000 completed an elementary course covering fifty class periods. The growth of the movement is rapid, the increase in enrollments in the six years preceding 1911 being eightfold. (See *Organized Sunday School Work in America*, published by the International Sunday School Association, Chicago, 1911, pp. 150 f. and 310.) The subjects ordinarily included in training courses are four: principles and methods of teaching, child study, organization and administration of the Sunday school, and the material of instruction. Systems for promoting and supervising such courses are gradually shaping themselves, partly through the International Association, partly through religious denominations, partly through independent agencies. A beginning of correspondence instruction has been made. One product of the movement is the output of a great variety of teacher-training manuals, too many of which are only weak echoes of the knowledge of others, and few of which provide a method whereby teacher training shall itself employ sound methods of teaching. The outlook with respect to the problem of securing competent teachers is not without hope. Somewhat rapidly the following policy is coming to prevail: (1) Without neglecting to hold classes for present teachers, special stress is laid upon organizing normal classes of promising young persons who have not yet taught. It is proposed to train these persons at least two years before they are put in charge of classes; to give this training primarily at the regular Sunday session of the school; to make the class a permanent feature of each school or group of neighboring schools; and to make the work vital and practical by including in it a considerable amount of observation and practice under direction. (2) For leaders of such classes, and for generally higher skill in Sunday school leadership, attention is turning in three directions — to trained public educators, to the theological seminaries, and to the colleges. The seminaries are already actively increasing their instruction in religious education to the end that coming generations of pastors may be ready to lead and to prepare leaders. As to the colleges, an active and successful propaganda is making to induce them to offer courses intended to fit laymen for the work of religious education in their parishes. In addition, it should be said that a few schools for training lay religious workers already deal with the Sunday school problem in a serious way, and that the number of such schools is increasing. Many churches employ either a director of religious education (minister or layman) or other paid organizers. At bottom, of course, this entire system of voluntary teaching depends upon religious devotion. This is of the essence of the enterprise. Religious devotion furnishes, too, not only zeal for the work, but also one of the prime qualities of the successful teacher — the consciousness of an important cause that binds him and the children before him into a hearty fellowship.

Physical Equipment. — The gradual evolution of the Sunday school from an assembly to a school is reflected in the history of Sunday school architecture. All types coexist at the present time, from the confusion of the large room with many classes in it to the proper provision of a separate room for every class, with all intermediate forms. The necessity for separate classrooms, on the one hand, and places for assembly or worship, on the other, is an embarrassing one in most churches. The nearest approximation to a solution is found in large churches that maintain a variety of activities through the week. Here we commonly find a considerable number of rooms, such as clubrooms, committee rooms, social rooms, and a gymnasium, that can be converted to Sunday school uses on Sunday. In general the line of economical progress is this: to transform the "opening and closing exercises" into a service of worship held in the church itself with all its assistance to the spirit of devotion; to enlarge the classes by fusion of the present small groups (made small by the necessity of teaching them in distracting surroundings); where the number of pupils is small, to avoid separating boys and girls too early; to provide one room for beginners (age four and five), and if some grades must go without a separate room, only one for the primary department (six, seven, eight); and to provide a room for every other class, even if the school must be divided into sections that meet at different hours. Cases are known in which private houses near the church have been opened for the use of classes that could obtain no separate room in the Sunday school building. In other cases, distraction has been reduced in a large room by separating the classes by curtains supported by removable posts. The proper equipment of a classroom varies with the grade, of course. All should have seats adjusted to at least average height, and generally tables should be provided so that children in the lower grades can do some handwork, and the older pupils can take notes. For elementary grades no form of table has been found better than three narrow tables (about the width and length of kindergarten tables, but graded to height) placed together in the form of a hollow square. With the teacher seated at the opening of the square, a true conversation circle can be formed. The remaining equipment of these rooms is directly indicated by the effort to make the Sunday school a school. Blackboards, maps, materials for making relief maps, materials for mounting pictures and making picture books — these are a sufficient index of the direction of present efforts.

Financial Support. — The predominant method of support is to solicit contributions from pupils from Sunday to Sunday. But there is growing objection to this method on the ground, first, that the school should be a church school and therefore included in the regular budget of the church; and second, that the contributions of the pupils should be educational in aim and method, that is, devoted to religious ends that become an object of study in connection with the giving. This method is already widely used in respect to missions. The cost of Sunday schools cannot be ascertained from any existing records, partly because of lack of uniformity in records, partly because the church's educational work has not yet been clearly differentiated in the minds of either ministers or laymen. For example, the proportion of the pastor's salary that should be charged to educational work, or the proportion of interest on investment and of the running expenses of the plant, has rarely been ascertained. A rough, though careful, estimate made on behalf of the Child Welfare

Exhibit in New York in 1911 indicates that here the average expenditure, all such items included, is about $5.50 a year for each pupil enrolled. But because of the extraordinary value of church property in this city, this amount is doubtless several times in excess of the average for the country at large.

Relation to Church and Community. — The point of view that is now developing is that the Sunday school is a church school, or more strictly still, that the Sunday school is the church engaged in certain of its functions. This implies not only that the pupils are being trained for confirmation or full membership but that they are here and now to participate in church activities, — whether worship, or missions, or philanthropies, or social enjoyments, — and to be educated thereby. This brings the school at once into living relations with the world, and education becomes just a part of living in the present situation. This movement is still in its infancy, for the traditional Sunday teaching has commonly assumed that the pupil will make application of Christian principles to life by and by. But of the future growth of this method there can be no doubt. Just now it puts the chief stress upon missions and philanthropies, but already the eyes of many are turning toward the Sunday school as the place above all others where we can hope to train large numbers of children in the principles of social justice. The weight of the Federal Council of Churches and of whole denominations is tending to bring this to pass. Already various adult classes (and the number of adults in Sunday schools is rapidly increasing) have studied civic problems of their own community and entered actively into social reforms. Further, the Sunday school tends to interest itself more and more in the social, recreational, and industrial life of its pupils. Sunday school baseball teams have become common; gymnasiums and social privileges are commonly provided in the larger communities by churches that have means therefor; fresh air work, tuberculosis work, and social settlement work of many kinds are all linked up with the Sunday school.

The Question of Time. — Ordinarily Sunday schools are in session about an hour and a quarter once a week. Usage is divided between a morning session before public worship, a session immediately after such worship, and a session about the middle of the afternoon. Much depends upon local conditions, but the general tendency is to connect the Sunday school and the morning worship so that both may be attended with the least difficulty. The hour before public worship has the advantage of finding the children fresh and relatively free from competing interests. It has a still further advantage of providing the best way of unifying the life of the Sunday school with that of the church as a whole. Various methods for making the Sunday school and the public worship essentially a unit have been adopted, such as keeping the children through a portion of the worship, preaching a five minutes' children's sermon each time, and even fusing the closing worship of the school with the opening of public worship.

There is much complaint that the amount of time for instruction is too small. It does not average over thirty minutes a week. To get through the required mathematics of the New York City school system at this rate would require forty-one years; to get through the penmanship would require fourteen years. In order to secure more time for religious instruction it has been proposed that we adopt a plan like that of the French, namely, to excuse from the public school on Wednesday afternoons any pupils whose parents desire to place them under religious instruction. (See G. U. Wenner, *Religious Education and the Public School*, New York, 1907.) The lack of support for this plan is probably due to the following cause: that the time already available can be made more fruitful by the adoption of correct methods; that more time can be had on Sunday either by reducing the time (often uselessly employed) of the opening and closing exercises, or by lengthening the session; that until the churches are better prepared in point of physical equipment, lesson material, and trained teachers, to maintain habits of order and of study among pupils, the public school authorities might properly deny the suggested petition. H. F. C. and G. A. C.

See Religious Education.

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SUPERINTENDENT OF BUILDINGS AND GROUNDS. — See CITY SCHOOL SYSTEMS; JANITOR.

SUPERINTENDENT OF SCHOOLS. — A term applied to the chief educational officer of one of the larger units for educational organization and administration, such as the state, county, township, town, city, or district. Other synonymous terms are frequently used, such as superintendent of common schools, superintendent of free schools, superintendent of public instruction, superintendent of education, or commissioner of education, etc. The title of superintendent of free schools or superintendent of common schools historically represented an earlier conception of the office, that of superintendent of public instruction a somewhat later conception, and that of superintendent of education, or commissioner of education, a still later and more inclusive conception. The tendency in recent legislation has been to bring all forms of education under the oversight, at least, of the state, and to require that the standards of nonstate education shall not be lower than those maintained by the state schools. The term superintendent of public instruction then becomes too restricted a term. (See PRIVATE SCHOOLS and SCHOOL ADMINISTRATION.)

State Superintendent. — A state superintendent of schools, under one title or another, is found in each of the American states excepting Delaware. In this state the state auditor acts *ex officio* in the collection of statistics and the issue of blanks, laws, etc., while a state board of education acts as the controlling head of the educational system. In seven states the state superintendent of schools is appointed by the governor; in four states he is appointed by the state board of education; and in the remainder he is nominated and elected by vote of the people. In three states the appointment is annual; in eighteen states he is appointed or elected for two-year terms; in two states for three-year terms; in twenty-one states for four-year terms, in one state for a five-year term, and in one state for a six-year term. The tendency within recent years has been to lengthen the term, where constitutional objections do not prevent. In a few states, such as New York and New Jersey, the state superintendent is at the head of a well-organized state school department and possesses some real power; in a few other states, as Massachusetts and Connecticut, he possesses little real power but exercises much influence; while in the majority of the American states, the state superintendent is, to a large degree, a political figurehead possessing little real power, and exercising but little real influence. The political basis of nomination and election produces altogether too often a statistical and clerical officer rather than an educational leader. The office, however, is one of great potential power and usefulness and doubtless will be made such before long by the elimination of the political basis of selection and the addition of important powers and functions. Potentially the office is as important as that of president of a state university, but actually it is so in but very few states. See STATE SCHOOL ADMINISTRATION, and the articles on the different state school systems (ALABAMA; CALIFORNIA, etc.), for a statement of the powers and duties of the state superintendent in the different American states.

County Superintendent. — The next school superintendent below the state is the county superintendent of schools. The title of this office varies in about the same way as that of the state superintendent. In seven states the county superintendent is appointed by the state or the county board of education; in two states he is elected by the school trustees (Pennsylvania and Indiana); in one state by a special board of school directors elected for this sole purpose (New York); and in the remaining thirty states he is nominated and elected by the people. The office does not exist in eight states (the six New England States, Ohio, and Nevada). In twenty-four states the term of election or appointment is two years; in two states it is three years; in thirteen states it is four years; and in one state it is five years. In states organized under the county system of school administration (*q.v.*), the county superintendent acts as the executive officer of the county board of education (*q.v.*), and usually possesses important powers and functions, and in a number of states he has been given many statistical, clerical, financial, legal, and educational duties. In some states, however, particularly those in which the old district system (*q.v.*) is still strong, he is primarily a statistical and clerical officer, possessing but very limited powers. The chief drawback to the efficiency of the office is the political basis of selection, the local residence requirement, and the uncertain and in any case limited tenure of office. The office, like that of the state superintendent, is one of great potential usefulness and power, but can be made actually such only by the elimination of the political basis of selection, and the requirement of educational and administrative standards for the office. See also County System of Administration; County Boards of Education; Rural School Problem, the; Rural School Supervision; Supervisory Certificate. For a statement of the powers and duties of county superintendents in the different American states, see the articles on the different state school systems (Arizona; California; etc.).

Town and Township Superintendents. — In New England the county has never been used successfully as a unit for school administration, and the office of county superintendent does not exist. Instead, the town (see Town System) is the unit of school administration below the state, and town superintendents, or superintendents for unions of towns, are the rule. The township system (*q.v.*) found in the West is analogous, and township superintendents are here employed. The town superintendent of schools in New England performs duties analogous to those of a superintendent of schools in a small city, if the town is compact and well populated, and somewhat analogous to those of a county superintendent of a small county, in a union of two or three thinly populated towns. The same is true of a township superintendent of schools in New Jersey, Ohio, or Indiana. He supervises the schools of his town or township, or union of towns or townships, under the direction of the town school committee or township board of education, acting as its executive officer. In Massachusetts, every town must either employ a town superintendent of schools, or join with some other town in a union to do so. In the other New England states, the employment of a town superintendent is optional, but with a state grant for salary of the superintendent to towns which do so. In New Jersey, Ohio, and Indiana, the employment of a township superintendent is optional, but, excepting where the township is coincident with a village or city, or has been centralized (see Consolidation of Schools), few township superintendents have so far been employed. Even in Ohio (*q.v.*), where there are no county superintendents to look after the schools, no great number of township superintendents are found. See also Town System; Township System, and the articles on the state school systems in each of the New England states, New Jersey, Ohio, and Indiana, for a statement of powers and duties of town and township superintendents.

City or District Superintendents. — The city or district superintendent is to-day a common feature of American schools, nearly all cities employing a city superintendent of schools. Though cities are commonly regarded each as a single school district, being merely a school district grown large, the term district superintendent is seldom used. The term superintendent of public instruction is sometimes used instead of superintendent of city schools. In some of the larger towns, the title of supervising principal (*q.v.*) is employed, indicating a less well-developed supervisory organization. It is in the cities that we find the supervision of instruction best developed and the work of school supervision placed on the best professional basis. This is largely due to the fact that almost from the first the cities have been free to develop their school systems as they have seen fit, and also free to go into the markets of the whole country and get the best persons available for superintendents of their schools, entirely free from all such restrictions as local residence, party nomination and election, and a fixed salary schedule, which for so long have hampered the county superintendency in its development along professional lines. There are, of course, weak city superintendents and cities afflicted with local party and personal politics, but in general the city superintendent is the educational leader of his city, and a leader in a sense that the county superintendent is not. The best educational thinking by the practical schoolmen of America to-day is done by our city superintendents, and almost all of the important educational advances of the past twenty-five years have been made by our city schools. So markedly has this been the case that it has contributed in no small degree to the creation of the present rural school problem (*q.v.*). In our larger American cities, with their very complex educational problems, their many racial and social difficulties, and the large size and scope of the system, the position of city superintendent of schools calls for a high degree of educational and business leadership. See also City School Administration; Supervision of Teaching.

E. P. C.

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SUPERNORMAL CHILDREN. — The consensus of evidence, biological, psychological, and statistical, indicates that mental ability, like all other biological traits, is distributed in the form of the so-called curve of probability. If this be granted, it follows (1) that mediocrity is the commonest condition, (2) that instances of ability superior to and inferior to mediocrity are of practically equal frequency and degree, and (3) that the more an ability deviates from mediocrity, in either direction, the less frequent is its occurrence. The idiot is rarer than the moron, the genius than the man of talent. The root of this distribution undoubtedly lies in heredity, in native endowment. Education cannot create ability; it can only develop the latent possibilities given by heredity. Educational agencies, however, cannot lose sight of individual differences; educational training cannot be conducted as if all pupils were alike in native endowment. This truth has been clearly recognized in so far as it applies to the lower end of the curve of distribution; we have to-day, in consequence, a flourishing pedagogy of the subnormal. But we are only beginning to realize the necessity of special adjustments of our educational agencies to meet the needs of the upper end of the curve, to develop a pedagogy of the supernormal. And here it may be noted that by supernormal we imply not something abnormal, or beyond the limits of the healthy and the wholesome, but a mental endowment superior to the average, a condition that corresponds on the plus side of mediocrity to subnormal on the minus side. The supernormal child is the gifted child, the talented child, the child of superior ability.

Quantitatively, superior ability may evidently vary all the way from ability just noticeably above the average up to the most extraordinary manifestations of genius. With real genius, the kind of ability that appears in, let us say, one man in a million, the school has perhaps no special concern, chiefly because the appearance of such ability is so rare that administrators cannot be expected to provide special devices for its training — if, indeed, it be amenable to prearranged educational forms. The real problem of the school concerns the children who rank as the best two or three or the best half dozen in every hundred, for these are numerous enough to warrant special educational treatment.

Qualitatively, it is feasible to distinguish between general, or all-round, superiority and specific superiority. The problem of the school treatment of children of the latter type, of children who possess special talent in a restricted field, must doubtless await solution until we have met the larger problem of dealing with the former type. At present we know almost nothing in a scientific way about the genesis, distribution, and training of special talents. Psychologists, however, agree that children may be born with a constitutional tendency favoring superior achievement in music, in mathematics, in various phases of artistic creation, and probably also in linguistic and technical activities. The enlightening experiment of Dr. Kerschensteiner, at Munich, who by a simple test of drawing discovered a number of cases of exceptional ability in this field (ability that had in several instances been unsuspected by parents or teachers), and who was able to direct these children into appropriate careers, may serve as a pattern for similar "censuses" of special talent, which might be undertaken with profit in any large school system. We may hope that in time special "talent classes" may be organized to supply at public expense the training appropriate to children who bid fair to distinguish themselves in music, drawing, painting, dramatics, invention, and other special lines. Meanwhile, it is to be desired that psychologists should make extended analyses of individual children who display exceptional gifts in particular directions.

With regard to the education of gifted children of all-round or general ability, the thesis may be laid down that the needs of society demand special training for such children in the public schools and that this special training must be conducted in special classes, segregated from the regular school grades. To this thesis the following objections are sometimes raised. (1) It is occasionally asserted that there are no supernormal children — an assertion that disregards the cumulative evidence of biological and psychological investigation, as well as the evidence of common sense. (2) More often it is argued that supernormal children exist, but they will take care of themselves. Galton, to be sure, has sought to show that real genius " will out," but this is certainly not true of the lesser grades of superiority with which the school has to deal. We do not believe that a favorable environment can create ability, but we know that an unfavorable environment may hinder its fruition. Experience shows that poverty, ill health, poor teaching, and lack of encouragement may stifle native ability of a high order. We know only those talents that have succeeded. As Lester Ward has pointed out: " Great men have been produced by the cooperation of two causes, genius [innate ability] and opportunity; neither alone can accomplish it." (3) There is a popular notion that the precocious child should be held back, that an early manifestation of ability is an unfavorable sign. It is true that precocity does not guarantee superiority at maturity, but it is equally true that it frequently does precede it. We admit that it is better for a dull child to take a slower pace: why should a bright child, given a healthy body, be compelled to follow the pace of the mediocre child? To hold back a gifted child is to exert a baneful influence upon his development, and not merely mentally, in that he assimilates less information than he might, but more particularly morally, in that he forms pernicious habits of idleness, fails to feel the spur of competition, and fails to develop the higher ethical qualities that the school should bring into play. (4) It is argued by some that the special training of gifted children is not the business of the public school, but of the home. Yet the state has already recognized its responsibility to provide for the instruction of the intellectually fit by its system of state universities, with their research and graduate departments. Again, any argument that defends special provision for the subnormal for the sake of their better training will defend special provision for the supernormal for the sake of their better training. "Any exceptional talent, potential genius, or superior intelligence that remains undeveloped is a loss, not merely for the individuals themselves, but also for the progress of the nation and humanity" (Stern). The state, then, has reason to devote special attention to supernormal children. (5) It is argued by others that though desirable enough, special training for the gifted is too expensive or too difficult of administration. As a matter of fact, however, the additional expense is not great and is more than justified by the return upon the investment, while the administrative difficulties are being successfully met in several cities, as will be shown in a moment. (6) It is sometimes argued that to place the gifted child in special classes handicaps the pupils and the teacher of the regular class by removing the brighter and more capable members. But surely it is, as Kendall has said, "a travesty on the rights of bright children to keep them in classes below their ability for the purpose of helping on and stimulating pupils of less ability." The rights of the individual pupil are more sacred than the desires of the teacher or the classificatory boundaries of the graded system. (7) Finally, it has been objected that to segregate bright pupils would make them priggish, would develop a species of intellectual arrogance. This possibility may be avoided readily enough by due care in administration. Admission to special classes must be looked upon merely as a kind of specialization, as indeed it is, and continuance in them must be conditioned by persistent faithful effort, as well as by intellectual brilliancy.

There are, then, no valid objections to the thesis that supernormal children should be given special treatment in the public schools. It remains to be seen what has been, or might be, the nature of this special treatment. The disadvantages of the standard ironclad grade system are everywhere acknowledged. Various plans are in operation to secure greater flexibility. Do these plans serve the needs of bright children? Without going into the details of various systems of promotion (see GRADING AND PROMOTION), we may distinguish three main types of modification of the standard system. (1) Certain plans aim to keep the class together in promotion. Thus, the so-called "Batavia system" keeps the class together by expending extra effort upon the laggards. Here, it is evident, no attention is paid to the peculiar needs of gifted children. The "North Denver plan" reverses the emphasis and keeps the class together by giving more intensive, more extensive, and more independent work to the brighter pupils. They are, however, kept at the regular pace in their progress through the school system. (2) Certain plans aim to secure a different rate of progress for children of different abilities. Typical are the systems prevailing in Cambridge, Mass., in Chicago, and in Pueblo, Col. In the "Cambridge plan" pupils are classified according to their ability and go forward at three different rates, — slow, regular, and fast, — while at various points transfers may be made from one "track" to another. Bright pupils may accomplish the work of the first six years in four years, and it is worthy of note that these "fast" pupils do first-class work later in the high school. The chief objection to this system seems to lie in the expense. In the "Chicago plan," or "large-school plan," three or more sections are organized in each grade on the basis of ability. Each section goes forward at its own pace and is promoted as soon as it is ready for the work of the grade above. The bright section may gain one or two months over the slowest section in each half year of work. The plan permits close grading, but is feasible only in large schools. In the "Pueblo plan" each pupil sets his own pace. Extreme individualism prevails. Its promoter, Preston Search, was led to its adoption because he was convinced that "the bright, capable pupil has been retarded in his progress, has spent time in lifeless reviews and valueless repetitions of lessons, and has had his ambition stunted." The plan suffers somewhat from the lack of class competition, and it requires teachers of unusual ability. (3) The "segregation plan," illustrated in Worcester, Baltimore, Indianapolis, Cincinnati, Harrisburg, Lincoln, Neb., and perhaps elsewhere, by its system of "preparatory centers," more nearly meets the theoretical requirements of gifted children. Pupils who have done strong work up to a certain grade, usually the sixth, are transferred to a special room, where they complete their preparation for the high school under selected teachers. The work is arranged on the departmental plan and includes, as a rule, the Latin, German, advanced English, and sometimes the mathematics of the first year in the high school. Pupils from these preparatory centers enter the high school with sufficient advanced credit to save one year in their subsequent course. Statistics show, moreover, that their work in the high school is commonly not only successful, but of conspicuous merit. In one Baltimore center, selected pupils have been retained for a third year and are then easily able to finish the high school in two years. In Cincinnati, in 1910, an experiment was instituted in the segregation of bright pupils from the third, fourth, and fifth grades. The results were decidedly favorable; two years' work was accomplished in one year, while the atmosphere of the class was that of "joyful industry and orderly intelligent work."

We are evidently only at the beginning of special education for supernormal children. The segregation centers have developed only in the last decade or so. Many problems remain to be solved. When, for instance, should segregation begin? The Cincinnati experiment suggests that it may profitably begin much earlier than the sixth grade. Again, what should be the standard of selection? Thus far, the standard has been relatively low. At Baltimore, for example, the centers contain pupils whose rank is anywhere in the upper 25 per cent of the regular classes. But Goddard's application of the Binet tests to 2000 public school children at Vineland, N.J., indicates that only about 4 per cent are mentally advanced two years or more above their chronological age. Again, Petzoldt, in Germany, has proposed the establishment in Berlin of "élite classes" on such a basis as to select the best child in each 1500 to 2000 pupils. It would be highly instructive to have this experiment tried out. For ordinary purposes, however, classes with a selection of 4 to 5 per cent and with a total enrollment of 20 to 25 would seemingly be most desirable.

Other problems that press for solution are these: What is the relative part played by heredity on the one hand and environment on the other hand in the production of individuals of superior achievement? Is it true that the world is full of children of marked native ability who need only the opportunity to achieve their promise, or must we proceed, according to the tenets of the new science (or religion) of eugenics, systematically to breed human ability? How early in a child's life may exceptional ability be safely diagnosed? What physical, mental, or moral traits afford reliable criteria of superior ability, and how may these be detected or measured scientifically? How can we discover and foster special ability in musical, artistic, literary, mechanical, mathematical, scientific, and other lines? Can we surely distinguish, and by what methods, between mere precocity that does not culminate in final superiority, and real ability, early displayed, that fulfills its promise? Is it in any way possible adequately to meet the demands of the education of gifted children without segregation into special classes? Ought classes for supernormal children to pursue the regular curriculum at a faster pace, or ought they to provide a more intensive and more extensive training by different methods? Ought gifted children to begin formal school work at an early age, or ought they, on the contrary, to be held back from formal training till their eighth year or later? Is it desirable and feasible to subsidize the careers of gifted children?

These and many other scientifically and practically important special problems which the general problem of the supernormal child sets for solution make it evident that an extensive investigation of the whole field by a corps of educational and psychological experts is imperatively demanded. Such an investigation would repay many fold the time and labor expended. G. M. W.

See ABILITY, GENERAL AND SPECIAL; GENIUS; TALENT; GRADING AND PROMOTION; HEREDITY.

Great Britain. — In Great Britain the question of the supernormal child does not assume so much importance as in America and Germany. In fact, it may almost be said that conditions are reversed and more attention is paid to the bright than to the average or poor pupils. In the elementary schools, where each principal is to all intents and purposes autonomous, a system of flexible grading and promotion provides for the rapid progress of the able pupil through the elementary schools, so that in the seventh or highest standard the ages of pupils may sometimes vary from ten and one half years to fourteen or over. The bright pupil has always been provided for by scholarships to the secondary or grammar schools obtained in open competition. A large number of these are frequently gained by poor but able boys from elementary schools at the age of eleven or twelve. As a rule they carry only free tuition; sometimes additional maintenance grants are given. A scholarship is valid for three years and is usually renewable according to grade of work done. More recently, since the central authority in England began to interest itself immediately in secondary education, schools and school authorities have been compelled as a condition of securing government grants to provide free places to pupils between the ages of ten and thirteen coming from elementary schools. The number of free places to be offered is ordinarily 25 per cent of the total number of pupils admitted in the previous year. The percentage may, however, be varied with the consent of the Board of Education. By the aid of scholarships, provided by special endowments or local authorities, and free tuition, pupils can win their way through to the universities. At the same time, the system always makes some demand on the means of the parents, and in some cases school authorities offer maintenance grants as well as remission of fees. For an account of the system of recruiting candidates for the elementary teaching profession, see TEACHERS, TRAINING OF. In Scotland the system of district bursaries provides for the promotion of pupils from elementary to secondary schools.

See SCHOLARSHIPS; LONDON, EDUCATION IN.

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SUPERSTITION. — See Magic; Myths; etc.

SUPERVISING PRINCIPAL. — A principal of a school building, or group of school buildings, who teaches little or not at all, and who spends his time in the supervision of instruction and educational conditions. The term is also used somewhat, in villages and small cities, as a title for a person who, in a larger and more fully organized school system, would be called superintendent of city schools. See also Principal, School; Superintendent of Schools; and Supervision of Teaching.

E. P. C.

SUPERVISION OF TEACHING. — The chief function of supervision is to improve teaching practice. There are two aspects to the problem: (1) The supervision of practice-teachers in connection with their preliminary training course, and (2) the supervision of teachers in service. The first aspect is usually termed the "training of teachers," and the second " the supervision of teachers." The supervision of teachers in training differs from that of teachers in service largely in the greater degree of control exercised by the supervisor of training over both teachers and schoolroom conditions. In the one case the chief end is the improvement of the teacher's practice; hence the number of pupils taught, the hours of service, and the quantity of supplementary instruction and personal conference are regulated to this purpose. In the other case, the improvement of the teacher is thought of as secondary to the growth of children; hence the conditions of schoolroom practice are fixed, the number of teachers' meetings limited, and the right of the teacher to be consulted in determining policy extensive. The first type of supervision involves the relationship of a teacher to his students; the second that of a chief official to his staff of assistants. (See Teachers, Training of.)

Historically, the professional supervision of teachers in service has evolved from the lay function of inspection of schools, where cursory visitation and judgment were dominant. When the superintendent or supervising principal was evolved, this expert schoolmaster took over the function of lay inspection and, theoretically at least, greatly modified its purpose and method. The emphasis was shifted from judgment of the teacher as an end, to judgment as a step preliminary to rendering constructive suggestions that would improve the teacher's practice. Inspection became a mere basis for diagnosis. Thus the function of school supervision is inclusive of school inspection. The growth of cities has been chiefly responsible for the development of supervision. The specialized and graded city system of schools, with its interdependent units, required an enlarged degree of coöperation among its teachers, which was insured only by the presence of supervisory authority. In consequence, our best supervision is associated with the school systems of cities and towns. Supervision in the rural districts is still undeveloped beyond certain experimental beginnings. Supervision by the state has scarcely established itself save along a few restricted lines (*e.g.* minimum courses of study), high school inspection, technical training, etc. A discussion of the technique of the inspection, criticism, and supervision of the teaching process will therefore be most valuable if presented in the main from the standpoint of the conditions of city and town systems.

Conditions Underlying Supervision. — The attempt of one person to assist the work of another by critical judgment and constructive suggestion seems to be a simple enough matter, but in an actual school system it is conditioned by many factors which interfere with this relation and purpose. In cities where there is a congested population, a large school system, and many supervisory officers close at hand, the work of real supervision seems to be interfered with by an accumulation of administrative details which usurp the time and energy that ought to be given to work with the teachers. This certainly seems to be true of the superintendent, the associate and district superintendents, and most of the school principals in the largest systems. The special supervisors of music, drawing, etc., escape this preoccupation with the mere business details of administration, but they do not altogether escape another tendency to which supervision in cities is prone, — *i.e.* the tendency to demand a uniform and mechanical standardization of teaching which neglects local classroom conditions and the individuality of teachers. Where a system is large, authority is usually highly centralized in a chief official operating through a series of deputies. He gains his knowledge without adequate personal touch. Dependence upon him for final executive authority dwarfs the initiative and independence of those subordinates who work close to the teaching situation. The whole system tends to become bureaucratic. It is only in the cities that we hear the school described as a "lock step" for both pupils and teachers.

Generally speaking, the country school is not supervised. The teacher gets little direct personal attention. He suffers from neglect. The teaching population is sparse and distances are great, so that the cost of supervision defeats its realization. Should the county superintendent of schools and the county board of education essay to exercise some supervisory control from a distance it becomes even more mechanical than that in the city, for there is less opportunity really to see the teacher at work. Supervisory zeal under such conditions too often leads to the vigorous imposition of a uniform course of study and written examinations for graduation and promotions. This pressure stifles any other teaching purpose than that of preparing for the county examination which gives the teacher reputable status in his community or deprives him of it.

When the state attempts to interfere in local school affairs, similar results follow, particularly under the examination system; the supervisory officials of the state may be far more bureaucratic than those of the county. When they confine themselves to mere inspection, the results are not without success, though they still fall short of a flexible and thoroughly efficient management of the schools. However valuable indirect means of supervision may be, they are never adequate to correct the evils of existing tendencies unless they are made supplemental to what is essential, — the direct observation of the teacher's work with such personal conferences as will reveal the teacher's intentions and convey to him the supervisor's estimates and suggestions. The legislative and fiscal conditions underlying supervision must be greatly changed. The state school authority when once it has been organized upon an expert educational basis might better forego any attempt to exercise general supervision over schools. The very conditions of the case are such that actual detailed control of the teachers and the schools should be left to the local authorities. The state may well inspect for certain minimal requirements, but the minimum should be low; It might also foster certain needed innovations, such as vocational schools or agricultural instruction. In general, however, the state departments of education can best deal with organization and administration, leaving supervision to the local units.

The first need in the local units is to provide more money for supervision. This will involve a larger outlay in the country than in the city. The consolidation of schools always increases the opportunity and the provision for supervision; but the device of consolidation is inadequate. Counties ought to be divided into supervisory districts each in charge of a district superintendent, whose sole function should be that of supervising the teaching practice of teachers.

In the cities the increase of expenditure need not be proportionately so great. Ample provision of administrative bureaus (construction and supplies, certification and appointment, vocational training and guidance, compulsory education, etc.) will relieve the superintendent and his assistants of detailed administrative work, which, because of its pressing day-to-day recurrence, leads to the slighting of the teaching function, for the fostering of which all other school functions exist. The school principal should be given a competent assistant or clerk who can relieve him of the office work which interferes with the supervision of his teachers. Providing local officials whose chief business is supervision and freeing them from the distractions of administrative responsibility are two policies which are fundamental to the systematic and efficient improvement of the teaching corps at large.

Inspection. — All sound supervision of schools must be based upon acquaintance with actual conditions in the classroom. There are two current modes of becoming acquainted with the work of teachers: (1) Personal visitation or inspection of classroom work; (2) the impersonal analysis of the teacher's efficiency through examinations, or similar tests of efficiency. The two methods are supplementary. In the past the examination system has been dominant; more recently personal inspection has become the chief method. The examination mode of judging the effectiveness of school work has had a recent revival in the attempt to apply efficiency tests, statistically interpreted, to the schools. It is proposed that the supervisory staff in the largest school systems be supplemented by a bureau of efficiency, employing scientific methods, the chief work of which will be to provide the supervisory staff with a knowledge of conditions which personal inspection does not ordinarily reveal. The appointment of expert boards of inquiry into school efficiency by superintendents, boards of education, and other bodies has stimulated the whole movement for the incorporation of permanent bureaus of efficiency in all large systems as part of the supervisory branch of school administration. Such inquiries can reveal only conditions of failure or success and perhaps some of the factors underlying them. It remains for personal inspection to determine whether conditions revealed by these inquiries exist in each particular classroom, and for personal supervision to apply its means to the improvement of particular teachers. Efficiency tests are highly valuable additional methods for estimating the work of schools, but they do not supplant personal inspection. (See Tests of Results of Instruction, under TESTS.)

The purpose of general efficiency tests is to give a more general, organized, and accurate impression of certain school conditions than the supervisor is likely to gain through personal inspections. In a similar manner, a systematic method of personal inspection is desired to overcome many of the shortcomings of casual visits to classrooms. The principal who visits each class in his building once or twice a day gains valuable impressions of a particular type. He notes whether the instruction is proceeding under hygienic and sanitary conditions, whether the children are in good order, interested, and at work; whether the teacher's manner is appropriate to the work of the moment, etc. What he sees is indicative if not representative of the teacher's habitual control of the class, and it gives him opportunity to correct flagrant defects or minor ones of frequent recurrence. Such short periodic inspections are useful, but they do not give thorough enough impressions of the teacher's work. They must be supplemented by longer visits which offer sound comparative judgments because they are part of a systematic scheme of inspection by grades, subjects, or aspects of method. Each of these modes of systematic inspection has its advantages and its limitations because each is an attack from a special point of view. In consequence they should be used to supplement each other. The inspection of a system by grades gives a horizontal view, which reveals the relative efficiency of classes in the performance of the same work, and the effectiveness with which the various subjects of a given grade reënforce and fit into each other. Usually, the supervisor will go through all the first grades, then through all the second grades, etc. In inspection by subjects, a vertical view is obtained. The progression of the course of study and the teaching from the lowest to the highest classes is best revealed by this approach. Faulty articulation in the work of adjacent grades is made apparent. Such inspection usually begins with a single subject in the lowest grades, *e.g.* reading in the first grade, geography in the fourth, Latin in the first high school year, and proceeds through the highest class. Inspection by grades and that by subjects cover the same ground from two different angles, and with a different emphasis and order. For the most part, both methods keep within grade and subject units. There are many special aspects of teaching upon which attention should be focused because ordinary methods of inspection do not adequately take them into account. The inquiry of the inspector needs to take such forms as: Is the objective work of the school in all subjects and grades rightly placed and handled? Are the children developing initiative? Are the motives for learning social rather than individualistic? Is sufficient drill provided at the right place? In contemporaneous practice there is not sufficient systematic inspection of schools in terms of these specific aspects of instruction. The aspects that are taken into account by any subject or grade inspection are usually those traditionally connected with the particular grade or subject, or those which have happened to come into the particular inspector's mind. Under such a system particular aspects are examined in one place and not in another, *e.g.* formal aspects of instruction are noted in reading, writing, and arithmetic and not in geography and history; objective work and dramatization in the primary classes and not in the grammar grades. The inspector should inquire if there is ample and appropriate use made of development, study, drill, examination, review, or expression in all subjects and grades. In like manner he might ask if the moral, social, æsthetic, formal, technical, objective, inductive, deductive, oral, written, and other aspects of classroom instruction are properly provided for throughout the school system.

Under the systematic inspection of teaching by grades and subjects, the unit of observation is generally the lesson period, *i.e.* that portion of instruction in a subject given within a single daily time assignment. The observation and criticism of the lesson unit is specially important in supervision because it usually forms the basis of discussion between supervisor and teacher. This is the conspicuous practice in the training of teachers in normal schools. In consequence, the technique for observing and estimating the lesson has a large importance. Even with knowledge of the teacher's lesson plan, which reveals the instructor's intentions and steps of procedure in advance, it is difficult for the observer to grasp all the significant details and to see them as a related whole. Indeed, the contingencies of classroom teaching may and usually do shift the teaching situation to unanticipated grounds, where unplanned methods of teaching are employed. The proper organization of observations and judgments is partly insured by the device of noting the progress of the lesson in terms of its lesser psychological movements. Under the theory of the American Herbartians, these movements would be the "formal steps of the recitation" (see RECITATION, METHODS OF); under the more flexible view of contemporaneous theorists, the movements might be any of the types of teaching procedure known to modern practice. In a particular spelling lesson, for example, the first movement in the complex included within the lesson period might be a *testing* of the words which had been studied, the second a *presentation* of the correct spellings of the words misspelled; the third, a *drill* upon the same, and the fourth, an *assignment* of words for further study. The supervisor would judge each movement, and the transitions from one movement to the next by two standards: (1) is the result arrived at in each teaching movement worth achieving, and (2) is the procedure utilized the most efficient and economical. The first judgment is usually one of sociological values; the second of psychological values. In the first movement mentioned, that of testing, the appropriateness of the words included would be estimated. If the words were outside of the normal vocabularies of children, the whole movement would come under question, however well it might be taught. If the words were properly selected, they might be inadequately tested. Indeed, the method employed might not constitute a real test. Each movement should be judged in turn. Of course the relation of each movement to every other and its contribution to the purpose and structure of the whole lesson would also have to be taken into consideration. This method of breaking up the lesson into its units of movement and judging each unit as well as the general structure and progress of the lesson is valuable in giving an effective focus of attention, in selecting, relating, and remembering details, and in bringing judgment to bear at the right points. It offers a safeguard against criticisms which are mere personal impressions unbased upon accurate observation and analysis; it organizes the details of the lesson procedure so that they are readily recalled in support of judgments offered in subsequent discussion. The tendency which criticism has everywhere to focus upon obvious errors is supplemented by the opposite tendency which this technique enforces, namely, to find the rational grounds for whatever is appreciated as successful teaching. The result is a more wholesome, rational, and fair criticism of the teacher's work. In time, the use of such a detailed and systematic mode of inspection by typical movements enlarges the supervisor's power to gain immediate accurate impressions in both casual and systematic inspection.

Criticism. — The inspector is necessarily a critic, at least to the extent that he arrives at immediate judgments of the worth of the teaching under observation. But in practice after-reflection of a critical sort is almost always necessary. Some judgments are too extensive or too complicated to be made offhand. Many points remain in controversy when the next stage of instruction intrudes upon attention. Even immediate judgments, about which the experienced observer is fairly certain, must be brought to the test of careful critical analysis. The function of criticism, as a rational procedure, proceeding deliberately in a period of after-reflection, is therefore to be distinguished from inspection.

The function of criticism is to arrive at rational estimates of worth. These appreciations, whether of effectiveness or defectiveness, are always accompanied by their reasonable grounds, *i.e.* the standards of criticism and the evidences of conformity or violation. Here criticism has the purely intellectual function of arriving at judgments. For the time being the critic is not specially conscious of any practical purpose. His aim is merely to arrive at the truth. Criticism, operating in this scientific spirit, must not be confused with supervision, which is "applied criticism," for unlike the latter it has no present regard for the immediate consequences of its judgments. The product of criticism is merely an impersonal and truthful statement of the right and wrong of teaching.

There are certain general principles which ought to be kept in mind by the critic. The judgments of criticism are always relative rather than abstract. A principle of good teaching cannot be realized equally well under all conditions. What a specific teacher may do is determined by many varying factors: — the subject matter involved, the children instructed, the social demands of the community, and the natural and acquired abilities of the teacher. Supervision may aim chiefly at improving the teacher's ability, but it cannot expect improvements regardless of the other conditioning factors. When theoretic standards are applied to concrete practices, they are always modified so as to conform to what may reasonably be expected. And a reasonable expectancy is also determined by the state of pedagogical theory, contemporaneous professional practice, and the given teacher's previous achievements.

When reasonable judgments are formulated, they may be used in two ways: (1) As a basis for interpreting educational theory, or (2) as a basis for improving teaching practice. The first use of criticism is found in the presentations made by student teachers or other learners in classrooms where educational theory is being developed on the basis of concrete observations. The second use is found in the presentations made by supervisors in conferences with teachers where improvement of teaching skill is sought. Naturally the presentations of the estimates arrived at are different under the two circumstances. It may be well to say something of each.

The supervising critic who presents his

judgments to teachers in a school system will seldom give his complete judgments of any lesson observed. It is seldom possible for him to expect to reconstruct so much at once. The theoretic critic who is receiving the more limited impressions of his students for the purpose of clarifying their theoretic notions finds it useful to call for an orderly and full presentation of all their observations and judgments. The latter is difficult to get, as every person in charge of the development of theory through the observation of practice has found. Teaching students to observe a lesson by the method of focusing on typical teaching movements (see above) is fundamental. But they should also be systematic and orderly in presenting their judgments. This is as true of oral as of written criticisms. The various orders of presentation usually employed are: (1) A *narrative order* of presentation, where the discussion follows the order of the events, incidents, and movements of the lesson observed, reference to the teaching principles involved being made in connection with each step. (2) A *logical order* of presentation, where the lesson is discussed in terms of the most important principles involved, the incidents, events, and movements being cited when needed as concrete illustrations without regard to the order in which they have occurred in the lesson. (3) A *mixed order* of presentation, where an alternating use is made of both narrative and logical treatments as clarity of exposition may demand. Beginners succeed best with the narrative order; later with the logical order. The experienced critic is more likely to use the mixed order.

Where criticism is presented at teachers' meetings for the practical purposes of improving teaching methods, the purpose is usually to increase the insight of the teachers preliminary to the improvement of their actual school teaching. What has just been said of the presentation of criticisms by students applies in large part to the presentations of supervising critics made before regularly employed teachers. It does not fully apply to personal conferences held by supervisors with individual teachers for the direct and immediate improvement of their teaching methods. This more intimate, personal, and immediately practical function is what is called *supervision* in the narrower technical sense. Here the presentation of criticism is so directly applied to a human factor and becomes so greatly modified by additional considerations that we speak of this presentation of criticism as supervision. Supervision is here an *applied criticism.* The chief factor in determining the mode of application used is a more or less independent human being (the teacher) who may become, by virtue of the particular application, an indifferent, a hostile, or a coöperating force in the supervisor's purposes.

Supervision. — It is to be noted that the effective, direct, personal supervision of teachers rests upon rational criticism, which in turn depends upon a systematic observation of the teacher's work coupled with a command over the teaching principles which constitute the standards of judgment. Assuming that the supervisor is a good rational critic, that he knows good from bad teaching and the reasons therefor, it must be said that he is still far from being a good supervisor. He must know good and bad teaching, of course; but he must know human nature, more especially the particular human natures of the staff of teachers which he is using for his particular purposes. He must know how to make them respond to his purposes. To this end, certain principles are suggestive and useful.

The supervision of teaching is distinctly a coöperative rather than a coercive function. The teacher, like any other human instrument, is more than a tool to be used; he is an end to be respected. Failure to recognize this truth inevitably makes supervision futile or coercive. In one case the teacher may become indifferent or passive, perhaps actively hostile or reactionary. In the other, the teacher may give a low order of response, complying formally in his use of an imposed method to which he brings no meaning or enthusiasm. In both of these cases, he might better have been left to his own spontaneous methods, however inferior their worth as judged by scientific tests.

The supervisory process should aim to stimulate and extend successful qualities as well as to inhibit and modify weaknesses. Prevalent supervision is, in too great degree, negative rather than positive. Correction is always more efficacious when preceded and accompanied by the recognition and encouragement of high skills. This recognition insures confidence in the supervisor's appreciation and justice and gives the teacher the stimulation needed to modify defect without sense of discouragement.

The extent of corrective supervision should be carefully proportioned to the teacher's ability to reconstruct his practice. The amount of self-correction that any teacher can consciously undertake is limited. New skills, consciously acquired, must have time to become habitual before further demands are made. Too many disturbances in the teacher's usual procedures produce an over-self-consciousness which interferes with the highest efficiency in teaching. The highest teaching art is not finally deliberate and self-conscious, but spontaneously intuitive of situations and quickly inventive of teaching means. The present strain of the teaching life may be partly due to the unavoidable but excessive changes in educational theory and practice incident to our rapid professional progress; it is certainly partly due to an overuse of corrective modes of supervision which give undue emphasis to defect.

In general, supervision should lay its emphasis upon the impersonal elements in the teaching situation. Such impersonal agencies as the apparatus, materials, subject matter, and pedagogical methods employed in teaching may be more readily and effectively brought into discussion than the personal characteristics of the teacher. Any tendency toward focusing attention on ingrained personal qualities makes correction too intimately "personal" and therefore more difficult. For the same reason, comparison with other teachers becomes odious, while comparison of present performances of the teacher with prior achievements is free from this unfavorable centering of attention on the teacher's self-interest.

In general, all supervision should be sympathetic. The difference between the older school inspection and the present supervision lies in the fact that the constant attitude of the former was that of judging the teacher, while the spirit of the latter is that of assisting the teacher. Impersonal judgments are basic in good supervision, but their effective application is more easily obtained if the supervisor maintains the attitude that his chief and final business is to aid the teacher. An unsympathetic attitude toward the teacher prevents an accurate interpretation of the teacher's work. The teacher's technique is devised to serve his own immediate ends, not those the supervisor may happen to have in mind. Worthless ends or improperly evaluated ends must not be confused with bad teaching technique. Trivial things may be splendidly taught, and worthy purposes may be inadequately attained. The point of view of the teacher ought to be kept in mind.

Supervision as applied criticism is always selective of the judgments it presents and enforces. This selection should take into account both the attitude and the ability of the teacher under supervision. A timid or inexperienced teacher may require a selection of appreciative judgments which will encourage self-confidence, correction being left till a later stage. An opinionated, self-confident, and aggressive teacher may require a destructive personal criticism that points out weaknesses chiefly, thus shocking him into a more open-minded consideration of new modes of procedure. Some teachers again ought not to have their defects indicated without suggestion as to how the correction is to be made. Still others might be offered a substitute method for experimentation with a minimum of reference to existing weaknesses. In the long run, all the criticisms of the supervisors would be applied to the teacher; they would merely have a different original selection and final distribution. The weakness of that type of supervision which relies upon the rigid enforcement of fiixed courses of study and the application of uniform examination tests is due to the fact that the varied ability, training, experience, and temperament of teachers are not adequately taken into account. The best supervision takes into account the personality and individuality of teachers.

All that has been said above applies to supervision in the narrower sense, *i.e.* impersonal criticism applied through direct personal supervision. The term is used in a wider sense to include all indirect measures employed to improve the teaching service.

In this wider sense, supervision would include general grade or subject examinations, efficiency tests, investigations into methods of promotion and the facts of retardation, promotional examinations, demonstrations in teaching, school visiting, uniform courses of study with suggestions as to material and method, school bulletins, teachers' meetings (general, district, school, division, grade, and subject meetings), teachers' institutes and conventions, reading circles, voluntary clubs and associations, etc. In addition, the school system often coöperates with outside agencies in the improvement of the teaching service by making provision for study scholarships at college and normal schools, leaves of absence, sabbatical years, university extension and correspondence courses, summer courses, etc. H. S.

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SUPERVISORS AND INSPECTORS. — The general practice in the United States is to use the term supervisor to designate one who supervises instruction in a local school system, and the term inspector to designate an agent of the state who inspects organization and administration as well as instruction. The practice in Europe corresponds with the general American practice. The terms, however, are often used somewhat interchangeably. In a city school system a principal who does not teach is usually called a supervising principal (*q.v.*), and district superintendents and assistant superintendents are sometimes also called supervisors. The term special supervisor is generally applied to those who hold meetings with the special teachers, and help to supervise the instruction in such special subjects as music, drawing, penmanship, manual training, domestic instruction, primary work, compulsory education, etc. The term health supervisor is also used in places to designate the school physician, though the term medical inspector is here much more frequently used. The term supervisor is also occasionally applied to state agents, though the term inspector is much more commonly used for such officials, as, for example, the state high school inspector, the state rural school inspector, the state factory inspector, the state child-labor-law inspector, etc. The term state agent is sometimes used, as in Massachusetts, for those state inspectors who represent the State Board of Education in the state. The term inspector is similarly used in England, France, and Germany. The supervision of instruction and the guidance of teachers is largely a local affair, and the term supervisor is the correct term to use for such, while state agents spend their time much more in the inspection of conditions and schoolroom practice, and the term inspector or agent is more strictly applicable to them.

For further information see the special articles on the different state and national systems, and also the articles on CITY SCHOOL ADMINISTRATION; STATE SCHOOL ORGANIZATION. E. P. C.

SUPERVISORS, GENERAL AND SPECIAL. — The superintendent, assistant superintendent, district superintendent, school principal, and other educational officials superior in authority to the classroom teacher are the general supervisors of teaching. They have general oversight over the teaching of all subjects studied by the children of their respective administrative units. The special supervisor is one who is responsible for the instruction in a given subject, such as music, fine arts, penmanship, manual training, physical training, etc. The relation of the supervisor or supervising teacher of a special subject to the other officials of the school system is one of subordination to the general supervisors exercising control within the unit (city or district) in which the special supervisor operates. In other cases (where the administrative unit allotted to the special supervisor covers a wider division than that of the district superintendent, the principal, or the teacher) the special supervisor is superior with reference to the materials and methods to be employed in teaching his subject, but subordinate in all matters where other conditions or factors are concerned. In such a complex set of relations, it is necessary to place the emphasis upon coöperation rather than upon division of authority. H. S.

See SUPERVISION OF TEACHING.

SUPERVISORY CERTIFICATES. — A special certificate, required quite generally of supervisors and inspectors in France, Germany, and some other European states, but as yet little employed in the United States.

As a means of improving the county superintendency in the different American states, a majority have made the requirement that the county superintendent must hold a certain grade of county or state teacher's certificate; but only a few states have as yet made provision for a special supervisory certificate. Massachusetts requires such of all town school superintendents, where any portion of the superintendent's salary is paid by the state; and Connecticut has provided for a somewhat similar certificate. In Louisiana, Georgia, Maryland, New Jersey, Wisconsin, and a few other states, an examination set by the state authorities must be passed by all candidates for county superintendencies. The questions in Louisiana must cover school administration, school supervision, and the theory and art of teaching; in Georgia, the theory of teaching; in Wisconsin, school law and the organization, management, and supervision of district schools; while in other states the subjects of the examinations are as determined by the state board of education, and usually include some professional subjects.

Where the state and county superintendents are elected by popular vote, as is the case in the large majority of the American states, it is important that a certificate of competency be required. The requirement of a high grade of teachers' certificate, such as a life diploma, state certificate, or first-grade county teacher's certificate, which represents the common requirement, is nevertheless inadequate for present-day needs. In many states the standards for obtaining these are such that they are held by the old teachers, regardless of general education and personal fitness for the work of school supervision. Executive ability and personality are of course qualities which an examination cannot test, but general education and the personal study of educational problems and administration can be considered and rewarded. It would be well if in all of our states a supervisor's certificate, separate and distinct from the teacher's certificate, were introduced, and granted to those presenting evidence of good education, teaching experience, and some knowledge of administrative problems. The certificates should be state and not county certificates, should presuppose teaching experience and a teacher's certificate, and should be required for all supervisory positions in educational work. Two grades of such a supervisory certificate might be granted: one to the successful practitioner, on the basis of an examination; and the other to graduates of colleges or universities, on the basis of education and professional study, but only after successful teaching experience. In either case the examination, or the professional study, should include such professional subjects as: the organization and administration of public education; classroom organization and management; the theory of education; school hygiene, with special reference to the hygiene of the school plant and the hygiene of instruction; and the school law of the state in question. The historical development and present problems of American education and some phases of educational psychology might also be added with advantage. The first group of subjects might be required for a certificate valid for a limited period, and the second group added for the life form. The requirement of something like the above standards would do much to improve the quality of American school supervision, and in particular of county school supervision. E. P. C.

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SUPPLEMENTAL BOOKS. — See HISTORY IN SECONDARY AND ELEMENTARY SCHOOLS; LITERATURE, CHILDREN'S; LITERATURE, ENGLISH; READING CIRCLES.

SUPPLEMENTARY METHODS. — All particular methods of teaching represent specialized methods of approach, each of which has some marked advantage with a counterbalancing disadvantage. No one special method is generally applicable. Each needs to be supplemented by others. Together, occurring in sequence as a group, they give the desired result. Thus, for example, the oral method of testing spelling gives the teacher a quick way of knowing whether the child has obtained a correct first impression; but the written test of spelling is finally necessary, since it is the manner in which the child will actually spell words in life. Oral and written spelling methods are therefore supplementary. Again, list spelling, spelling dictated sentences, and spelling in spontaneous paragraph writing are three methods, each of which is supplementary to the other two. In effective pedagogical method it is as essential to know which special methods supplement each other and how, as it is to command the special technique of each. H. S.

See TEACHING, PRINCIPLES OF.

SUPPLEMENTARY READING. — All reading books used in addition to the single legally adopted text furnished to or purchased by the individual child are called supplementary readers. Formerly, geography, history, and reading were taught from a single text. The recent tendency is to supplement widely with additional books so as (1) to enrich the content of the subject taught, (2) to avoid monotony, and (3) to motivate study and recitation by assignment of different readings to various groups of children. Supplementary reading first became an important method when the basal readers (primers and first readers) were formal, mechanical, and rather uninteresting, being constructed so as to give a special method of mastering the mechanics of reading rather than a valuable and vital content. Initiated in connection with primary reading, supplementary readers were soon utilized in the reading period of the intermediate and higher grades. The advent of geographical and historical readers marks the appearance of this method in the other subjects. H. S.

See READING, TEACHING BEGINNERS.

SUPPLIES, SCHOOL. — By this is usually meant those supplies necessary for the conduct of instruction or for the operation of the school plant. The former relate to the work of the teacher and pupil, while the latter relate chiefly to the work of the school janitor. The supplies for the teachers' and pupils' use are pens, pencils, ink, writing and drawing paper and supplies for instruction in manual training, sewing, cooking, etc. Formerly pupils were required to provide all of these at their own expense, and in a number of states this is still the case; but the greater economy of purchase and the still greater economy in school time have led many states to require that local school boards provide all of these from the school funds and furnish them free to the pupils.

In some American states textbooks (*q.v.*) are also included under the heading of free school supplies, while in a number of other states, the pupils are required to buy their own individual textbooks, the school authorities providing all the supplemental books (*q.v.*) used. Other supplies used in classroom instruction are chalk, erasers, maps, charts, globes, dictionaries, and reference books. These are supplied generally by school authorities, though many rural schools possess but a meager equipment of such teaching material. In a few American states the so-called school library fund is used to supply these necessities. The school supplies which relate chiefly to the work of the school janitor are wood, coal, brooms, mops, and cleaning material. Wood used to be, in many states, a tax on the parents of the children, each parent being required to provide a quota of firewood for each pupil sent to the school. This was known as the "fuel tax," but this has now been generally abolished, fuel and all janitors' supplies being furnished at the expense of the school district. Only in Louisiana does the "fuel tax" remain, and even there its levy is permissive only. E. P. C.

See Apparatus.

SURPLUS REVENUE GRANTS. — See National Government and Education; School Funds, Permanent.

SURPLUS REVENUE OF 1837. — See National Government and Education; School Funds.

SUSPENSION. — This may mean the suspension (1) of a pupil, (2) of a teacher, (3) of a fund or an apportionment of funds, or (4) of a school district. Pupils may be suspended temporarily by teachers and for a period of time by school officers or school boards, for willful disobedience of the rules and regulations of the school or for conduct opposed to proper order and discipline. (See Pupils' Rights, Duties, and Obligations.) Teachers may be temporarily suspended by school officers or school boards for insubordination, marked incompetence, or immorality, and the suspension, in the case of either pupil or teacher, may be made permanent by action of the board of education or board of school trustees. (See Teachers, Appointment and Tenure of.) The regular apportionment of the income from school funds or taxes to a school district may be suspended or withheld by county or state school officers for proper cause, such as the failure to provide adequate school facilities, to make proper school returns, or to obey the school laws. (See School Funds.) School districts themselves may be suspended by county or state school officers when the attendance at the school falls below a certain number, or for other statutory causes, in which case the district ceases to exist, the territory is annexed to other adjacent districts, and the property of the district is disposed of. (See Consolidation of Schools.) E. P. C.

SUSQUEHANNA UNIVERSITY, SELINSGROVE, PA. — Founded in 1858 by the Maryland Synod of the Evangelical Lutheran Church as a missionary institute; a new charter and the present title were obtained in 1894. The following departments are maintained: academy, college, theology, music, business, art, expression, and summer school. Students are admitted on certificate or by examination. The degrees of A.B. and B.S. are given by the college. The enrollment of collegiate students in 1911–1912 was 80, and of all students was 244. The faculty consisted of twenty-two members.

SWAMP-LAND GRANTS. — In 1849 Congress made the first swamp-land grant to Louisiana, giving the state all the swamp and overflowed lands, the proceeds to be used in constructing levees and drains. In 1850 the act was made to apply to all of the new states, though no swamp-land grants have been made since 1866. Over 60,000,000 acres were granted under this provision, about three fourths of which have been applied to educational purposes.

See National Government and Education.

SWAN, JOHN. — A typical writer of the first half of the seventeenth century on natural science. In 1635 he published *Speculum Mundi. Or A Glasse representing the Face of the World; shewing both that it did begin, and must also end; the manner How and time When, being largely examined. Whereunto is joyned an Hexameron, or a serious discourse of the causes, continuance, and qualities of things in Nature; occasioned as matter pertinent to the work done in the sixe dayes of the World's creation.* (1st ed., 1635; 2d ed., 1643, Roger Daniel, Printer to the University of Cambridge.) The work is the analogue in prose to the verse of Du Bartas's *Première Semaine* of which Joshua Sylvester made the translation: *Divine Workes and Weekes* (1592), a work combining scriptural and religious teaching, together with natural science, *i.e.* the study of "the creatures" or natural phenomena, as disclosed in expansions of the Biblical account of the Creation. This was the Puritanic substitute for the old Aristotelian treatment of natural science. Swan, following Du Bartas, introduced a poetic warmth in his treatment of the animal world. It should be noted that Swan affirms the old astrological views (discountenanced a hundred years earlier by J. L. Vives), basing the credence in astrology on Holy Scripture. F. W.

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SWARTHMORE COLLEGE, SWARTHMORE, PA. — Was founded in 1864 by the members of the Society of Friends, and opened to students in 1869. The name was derived from Swarthmore Hall, the north England home of George Fox. Nothing of a sectarian character appears in management, course of study, or requirements for admission, and the college has been admitted to membership in the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The site chosen for the college combines the virtues of country environment with easy access to a great city. It is a large tract (now comprising over two hundred acres) of lawn and woodland, about ten miles west of Philadelphia, overlooking the Delaware River and its valley all of which is so rich in historic memorials of the Quaker founders of Pennsylvania. The United States authorities had given to the post office standing on the edge of the college tract the name of Westdale, in commemoration of the fact that Benjamin West, the first great American artist and a president of the Royal Academy, was born in a house still standing on the college campus, and had there given the first crude expression to the forms of beauty which his eye perceived amid the modest environments of his parents' Quaker home. The presidents have been Edward Parrish (1863–1871); Edward McGill (1872–1889); William Hyde Appleton (1889–1891); Charles De Garmo (1891–1898); William W. Birdsall (1898–1902); Joseph Swain (1902–to date).

The students who first came to Swarthmore numbered 170, and comprised 82 girls and 88 boys. This approximate equality has been preserved to the present day, and has facilitated the maintenance of coeducation. When Swarthmore was founded coeducation was still looked upon with doubt or disfavor in the East. The theory and practice of the Society of Friends in home and church determined them to organize "college life in a home setting." Recent action by the board of managers provides that Swarthmore, in this generation at least, shall remain a small coeducational college, the number of students being limited to five hundred, not to exceed two hundred and fifty of either sex. The grounds, buildings, and equipment are valued at $944,202.53 (1911). In 1912 the income-bearing funds amounted to $1,440,066.26. The income for the year 1910–1911, including student fees, private benefactions, and receipts from private endowment funds, was $470,305.36.

The number of bound volumes in the library is 40,000. In 1912–1913 there were 409 students and 50 members of the teaching staff. The total number of degrees conferred is 1307. The number of alumni in 1912 was 1182, of whom 57 were reported as deceased.

W. A. A.

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SWEDEN, EDUCATION IN. — Area, 447,864 square miles; number of inhabitants in 1910, 5,521,943; capital, Stockholm, with 341,986 inhabitants in 1910; religion, Evangelical Lutheran.

Politically, Sweden is the oldest existing state in Europe, and with the exception of England, the only European nation that can look back on a national parliamentary development extending through centuries. Like England, Sweden exhibits a peculiar mixture of aristocratic and democratic tendencies, the latter at present predominating. The system of popular education in the kingdom dates from an earlier period than that of any other European nation. The country readily appropriates the educational advances made by other civilized nations, while in certain respects, especially in regard to physical education, it is a recognized leader.

Church and school in Sweden are both controlled by the ecclesiastical department. Legislation in their interests pertains to the government and the Riksdag in common, but regulations, ordinances, etc., are issued according to the constitution by the government alone (as a branch of the King's economical legislation). The practice has, however, become general for the government to invite the Riksdag to decide conjointly with it upon these minor questions, and no alteration of any importance is carried through without the consent of the Riksdag.

Christianity was introduced into Sweden in the eleventh century, and the archbishopric of Upsala was founded in 1164. The church was organized as in all countries brought within the pale of the Papal authority, and schools were established in connection with cathedrals and monasteries. The separation of the kingdom from Rome under Gustavus I was the result of political conditions, but it led to the triumph of Lutheranism, which already had many followers in the kingdom. The complete break from the Roman church and the formal adoption of the reformed religion dates from the battle of Stångåbro, Sept. 25, 1598, which secured the kingdom to Charles IX; the same year the Riksdag declared irrevocably for the Protestant faith and the exclusion of Catholics from the throne. Church and state are united, the king being the head of both. The diocesan boards (bishop and chapter) have the general superintendence of the lower public and the secondary schools in their respective dioceses; civil officials also participate in the administration and supervision of schools.

Primary Instruction. — Primary instruction was made obligatory by the primary school law of 1872. The school law now in force was enacted in 1897, but is in practical accord with the previous law. All parents are bound to see that their children receive instruction either in the public primary schools or in other schools where the teaching is of the same grade and character. If parents do not fulfill this obligation, the school board of the district has the right to remove the children from their homes and educate them at the expense of the parents. The compulsory school age is seven to fourteen years. The primary school comprises two divisions: the infant schools for beginners (seven to nine years), and the elementary school for more advanced pupils (ten to fourteen years). The course of studies is arranged to cover two years in the infant school and four years in the elementary school.

According to the number of pupils, these two divisions may be taught together or in two or more groups or classes. In the larger districts the infant school is taught in two and the elementary school in four progressive classes. Boys and girls are generally taught together; where there is a great number of pupils, separately.

The subjects of instruction are (1) obligatory: religion, Swedish, arithmetic, geometry, geography, history, natural science, drawing, singing, gymnastics, and gardening; (2) optional: sloyd, domestic economy and, in some places, a foreign language, English or German. Gymnastics and sloyd are taught, the former according to the Ling system, the latter according to the Nääs system, elaborated by the late Otto Salomon, founder of the Sloyd Training School at Nääs. These two systems have the exclusively pedagogical aim of promoting the harmonious development of the pupils, not the acquisition of sporting or technical skill.

Among the appliances for promoting the health and physical development of the children may be mentioned the school baths, in which the pupils can get a bath in winter time; work shops, where children who are not looked after at home may stay during their leisure hours, learn some manual work, and get nourishing food: the vacation colonies, the aim of which is to give sickly and feeble children in towns the opportunity of dwelling in the country during summer time; school journeys in the country undertaken by groups of pupils under the guidance of other teachers.

The school year extends over eight months (thirty-four and one half weeks). Yet all the pupils do not receive instruction the whole of this time, because in some districts, where there are many groups of pupils and only one or few teachers, the different groups must be taught either at different seasons of the year or on different days of the week. Thus a child may get instruction only half of the legal school year. The number of pupils in the primary schools for the latest year reported was 783,871; equivalent to 14 per cent of the population.

As to the result of the primary instruction it may be stated that all the young men enrolled as conscripts are able to read, with the exception of about one per thousand. Yet, the work of the primary instruction cannot be said to answer the claims of the present time, especially since the introduction of universal suffrage in 1908, which has considerably increased the political influence of the lower classes. A thorough reorganization of the Swedish primary instruction seems to be necessary. As a preliminary measure for the accomplishment of that purpose a Royal Commission was appointed in 1906 to investigate the whole situation.

Teachers of elementary schools may be either men or women. The infant school teachers are almost exclusively women. The elementary school teachers pass through the course of a training college which covers four years. To enter the training college the candidate must be at least sixteen years and not above twenty-six years of age, and on an entrance examination must show that he has acquired a tolerably complete primary school education. There are fifteen state training colleges, nine for male and six for female students, and two private colleges, both for female students. The number of students in the state colleges was, in 1910, male, 982; female, 641. The infant school teachers are trained by going through either the two first classes of a state training college for elementary school teachers or one of the private training colleges for infant school teachers. These latter colleges are, as a rule, intended for women students.

Teachers' salaries, as fixed by law, are: for elementary school teachers, 900 kronas (a krona = $26\frac{8}{10}$ cents) a year with an advance after five, ten and fifteen years' service of respectively 150 kronas for male and 100 kronas for female teachers. For infant school teachers, 600 kronas a year with an advance after five, ten, and fifteen years of 60 kronas. Teachers also have a right to free residence, wood for fuel, and a piece of land for gardening. In towns and also in many districts of the country, the teachers' salaries are considerably higher. In Stockholm, inclusive of the above emoluments, the salaries are as follows: for men teachers, 2200–3400 kronas, and for women teachers, 1700–2300 kronas.

The number of primary school teachers in 1909 was: men, 5801; women, 13,546; together 19,347, of whom 8 men and 7552 women were appointed in the infant schools. The primary school teachers manifest great ambition to extend their knowledge and by this means to raise their social and economical position. An association of primary school teachers, numbering more than 11,000 persons, makes great efforts to promote the interests of its members. This association has appointed a literary committee that publishes a series of pedagogical writings. For the benefit of the primary school teachers' holiday courses are arranged every year at the universities or in other centers.

The state training colleges, where the primary school teachers receive their education, are on the whole arranged in the same manner as fifty years ago, when they were established. It may be said, therefore, that the result of their work is not up to date. The Royal Commission above mentioned published (in February, 1912) a memorial on the reorganization of these colleges with recommendations intended to raise considerably the standard of their educational work.

The instruction of the public primary school is free of charge. The school district is bound to erect and support school buildings, provide them with furniture and the materials of instruction, and to provide the teachers with the statutory allowances and salaries, but is reimbursed by the state for two thirds of its outlay for salaries. The total expenditure for primary instruction in 1910 was about 42,000,000 kronas ($11,886,000), of which the state contributed about 10,700,000 kronas ($3,028,100).

The inspection and control of the primary schools is performed on behalf of the school district by the school board, and on behalf of the state by school inspectors appointed by the government.

Continued Instruction on the Basis of Primary Instruction. — For pupils that have left the elementary school, there are several continuation courses or schools.

Continuation Schools for pupils who have entered some trade. The school provides for a yearly instruction of at least 180 hours on certain evenings of the week through the year, or concentrated within one or two short terms. (Statutes of 1877 and 1886.)

Higher Division of the Elementary School with one to four progressive classes and the instruction going on during the whole school year. Such divisions are arranged in all larger towns. Parallel to this higher division of the elementary schools in the towns there are in the country the higher elementary schools. In 1911 thirty-four schools of this kind existed. A higher division of an elementary school or a higher elementary school that has four progressive one-year classes can be arranged as a municipal middle school, the instruction of which is organized as that of a realschule or lower secondary school. (See below, Statutes of 1907 and 1909.)

People's High Schools are institutions which exist almost exclusively in the Scandinavian countries and in Finland. They are intended for the adult youth, and their purpose is to inspire young men and women, especially of the peasantry, with ideal interests and to promote their intellectual and moral elevation. The course of studies covers one or two years. The courses for male students begin about the first of September and end about the beginning of May. The courses for female students last from the beginning of May to the beginning of August. There is no examination on leaving. The people's high schools are regarded as a powerful means of raising the general standard of the country's civilization. They are supported by grants from the county councils, agricultural societies, and the state.

Number of schools in 1910, 44; number of students in 1910: male, 984, female, 902; state expenditure in 1910: about 260,000 kronas, of which 35,000 kronas were for needy pupils. (Statutes of 1907.)

Schools for Defectives. — *Schools for the Blind.* — The instruction of the blind is obligatory; compulsory school age, seven to seventeen years. For the preliminary instruction there are two preparatory schools for the blind, one at Tomteboda and the other at Väkjö, and for the instruction of advanced pupils there is a blind institute at Tomteboda. At this institute there is also a course of training for those who wish to be teachers of the blind. These schools are supported by the state, but the county councils have to pay 300 kronas for every pupil. Number of pupils in 1911 was 198; state expenditure in 1911 was about 120,000 kronas. (Statute of 1896.)

Schools for Deaf-mutes. — The instruction of the deaf and dumb is obligatory and the concern of the county councils, yet with important assistance from the state. For this instruction the country is divided into seven districts with a school for deaf-mutes in each district. Compulsory school age seven to fifteen years. Number of pupils in 1910 was 635; the state expenditure in 1910 was about 164,000 kronas. (Statute of 1889.) Besides the above district schools, there are two private schools, viz. the mute school in Stockholm and the preparatory school for deaf-mute children in Gothenburg.

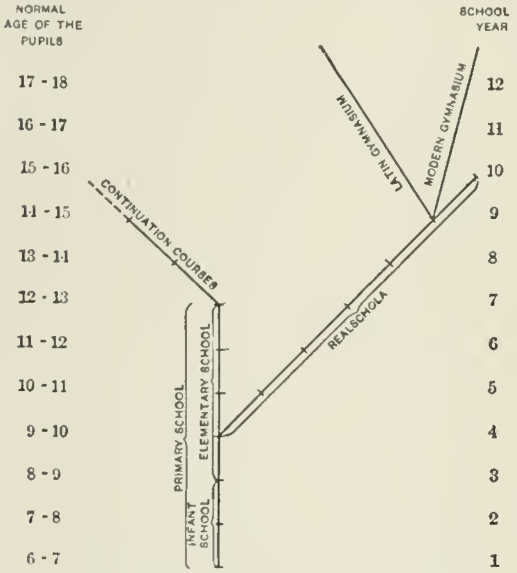
Schools for Idiots. — For the education of idiots there are (1) schools for children capable of education, (2) working homes for those who have left school, and (3) asylums for idiots not capable of instruction. There are at present twenty-seven schools for idiots, to twenty-three of which are annexed working homes, two separate working homes, and eighteen asylums. In 1910 the number of pupils was: in the schools, 895, in the working homes, 349, and in the asylums, 408. The cost for these institutions is paid by county councils, towns, private societies, and the state. The state grants 250 kronas for every teachable pupil in the schools and 100 kronas for each pupil in the working homes. State expenditure in 1910 was about 340,000 kronas. A training college for future teachers of idiots is established in Stockholm. (Statutes of 1904 and 1908.)

Secondary Instruction. — *State Schools.* — (Statutes of 1905, 1906, and 1908.) The *realskole* (lower secondary school) has six one-year classes and is finished by the *realskolexamen* (lower secondary school examination). The course of the *realskola* is a continuation of the third year's course of the primary school, or the first year's course of the higher elementary school. The age of entrance is nine years.

The *gymnasium* (higher secondary school) has four one-year classes and is finished by the *studentexamen* (higher secondary school examination). The course of the *gymnasium* is a continuation of the fifth year's course of the *realskola.* Thus a complete secondary school course involves three years' course in the primary school, five years' course in the realskola, and four years' course in the gymnasium. The gymnasium is divided into two parallel lines.

The state secondary schools are intended only for boys, yet in some towns the *realskolas* are arranged on the plan of coeducation of boys and girls.

The Swedish Public School System. — The following diagram illustrates the relation of the different schools comprised in the Swedish system.



THE TIME SCHEDULE OF THE REALSKOLA
(Number of Hours per Subject per Week)

Subjects	Classes						Total Number of Hours
	1	2	3	4	5	6	
Religion	3	3	3	2	2	2	15
Swedish	5	5	6	4	3	3	26
German	6	6	6	4	4	3	29
English				5	5	4	14
History	2	3	3	3	3	4	18
Geography	2	2	2	2	2	2	12
Mathematics	4	5	5	5	4	5	28
Biology	2	2	2	1	2	2	11
Physics				2	1	2	5
Chemistry					2	1	3
Writing	2	2	1				5
Drawing	1	1	2	2	2	2	10
Total number of hours	27	29	30	30	30	30	

Also Music and Gymnastics, obligatory subjects; French, sloyd, and, for girls in coeducational schools, needlework, optional subjects.

In the two highest classes the pupils have some liberty of choice inasmuch as they may drop one, or, under circumstances, two, of the obligatory subjects.

Outside the curriculum music, gymnastics, and musketry exercises are given. Pupils of the Latin gymnasium may in the two highest classes receive instruction in Greek instead of mathematics and drawing.

THE TIME SCHEDULE OF THE GYMNASIUM
(Number of Hours per Subject per Week)

Subjects	Modern Gymnasium				Latin Gymnasium			
	Classes				*Classes*			
	1	2	3	4	1	2	3	4
Religion	2	2	2	2	2	2	2	2
Swedish	3	2	3	3	3	2	3	3
Latin					6	6	6	6
German	2	2	2	2	2	2	2	2
English	3	3	2	4	2	2	2	2
French		4	4	4		4	4	4
History	3	3	3	3	3	3	3	3
Geography	2	1			2	1		
Logic and Psychology			1	1			1	1
Mathematics	7	6	6	6	5	4	4	5
Biology	1	2	2	1	1	2	2	1
Physics	3	2	4	3	2	1	2	2
Chemistry	2	2	2	2				
Drawing	2	2	2	2	2	2	2	2
Total number of hours per week	30	31	33	33	30	31	33	33

The school year, which covers thirty-nine weeks, begins at the close of August and ends at the beginning of June. In general the hours of instruction must not exceed six in the day. Each lesson is of forty-five minutes' duration. Between two lessons there must be a pause of at least ten minutes.

Number of schools: (1) schools including both realskola and gymnasium, 38; (2) realskolas for boys, 20; (3) realskolas for boys and girls, 19. Number of pupils in 1911: (1) in schools with both realskola and gymnasium, 16,352; (2) in realskolas for boys, 4103; (3) in realskolas for boys and girls, 2563, of whom 1124 are girls.

The teaching staff consists of principals, lektors, adjuncts, women teachers (in the coeducational realskolas) and instructors in music, gymnastics, and sloyd. The teachers get their training at the universities, where they have to submit to the secondary school teachers' examination (*filosofisk ämbetsexamen*). This examination is required for the position of adjunct. For the position of lektor it is necessary to pass the higher secondary school teachers' examination (*filosofisk licentiatexamen*) and to defend a thesis for the degree of doctor. The first examination requires about four years' study, the latter about four years more. After having finished the university examinations the candidate has to go through a trial year at one of the secondary schools appointed for that purpose. Women candidates must take the same training and examination as adjuncts or must go through a three-years' course at the higher training college for women (see below).

The salaries are, per annum: for principals of schools with both realskola and gymnasium, 6000–6500 kronas; for principals of realskolas, 5000–5500 kronas; for lektors, 4000–6000 kronas; for adjuncts, 3000–5000 kronas; for women teachers, 1500–2500 kronas. In addition to this, for principals: free residence, or compensation in lieu of it.

Number of teachers in 1910 was as follows: (1) principals, 78; (2) lektors, 252; (3) adjuncts, 753; (4) women teachers, 51; (5) assistant teachers, 135. The annual school fees in the state secondary schools amount to about 70 kronas ($18.76) in the realskola and 90 kronas ($24.12) in the gymnasium. The municipalities must provide the school building and residences for the principals. The salaries of the teachers are paid by the state. The state expenditure for the secondary instruction was in 1911 about 5,900,000 kronas.

The immediate direction of secondary schools is exercised by a supervisory board of five members, appointed by the government.

Higher Girls' Schools. (Statutes of 1909.) — With the exception of the above-mentioned coeducational realskolas and a higher girls' school annexed to the higher training college (see below), the schools for the secondary instruction of girls are private institutions. At present there are seventy-seven such schools, all subventioned by the state. They vary much in regard to organization and plan of instruction.

A higher school for girls generally comprises eleven progressive one-year classes, of which three are called preparatory and intended for children seven to ten years of age. The subjects of instruction are the same as in the coeducational realskolas. The school year covers thirty-six weeks. The number of pupils in 1911, exclusive of the pupils in the preparatory classes, was about 12,000.

The teaching staff consists almost exclusively of women. For their training there are the state higher training college for women in Stockholm and four private training colleges. To enter a training college the applicant must be eighteen years old and show by examination that she has acquired the standard of knowledge obtained in a higher girls' school comprising eight progressive classes above the preparatory division. The course of the higher training colleges for women teachers lasts three years; in addition to this there is an optional fourth year's course.

The salaries are: for women principals, 2000–2300 kronas and free residence; for teachers, 1200–2000 kronas. Number of women teachers in 1911 about 600.

The fees vary much. On an average they amount to about 150 kronas per annum. The state grant in 1911, 357,000 kronas; in addition to this 93,000 kronas for the training colleges.

Middle Schools. (Statute of 1909.) — As above mentioned, the higher divisions of the primary schools in towns, and the higher primary schools in the country may be organized so as to give the same instruction as the realskolas (lower secondary schools). These schools are called municipal middle schools. They have four progressive classes and are a continuation of the sixth year's course of the primary school, or the fourth year's course of the higher elementary school. They are of recent date, having been authorized by law of 1909. At present there are eleven municipal schools, and at least twenty-two private schools, which have been organized on the same plan. The middle schools are subventioned by the state.

Private Secondary Schools. — In consequence of the low fees charged in the state secondary schools, the number of private secondary schools for boys is small; at present, only four. They are, on the whole, organized like the state secondary schools, comprising both realschool and gymnasium. There are, also, six private secondary coeducational schools which are entitled to hold the higher secondary school examination. Both classes of private schools receive grants from the state and their supervision, like that of all secondary schools, is committed to the supervising board.

Technical Education. — Under the head of professional or technical schools are included specialized institutions of either primary or intermediate grade. The lower technical schools with evening and Sunday sessions numbered fifty-five in 1911. At Eskilstuna there is a technical school for young people already engaged in some trade, and a similar school at Stockholm, their combined attendance in 1910 numbering 2210 pupils.

Chalmer's technical institute at Gothenburg comprises two sections, one for pupils who have passed through the primary school, the other for pupils who have passed the leaving examination of the higher secondary school. The enrollment in both divisions averages about 400. There are also five technical schools which admit pupils from the lower secondary schools, their combined enrollment being about 700.

The Sloyd Association maintains a model school at Gothenburg which exemplifies the principles of the system as taught in the Sloyd normal school at Nääs.

At the head of the system of technical education is the technical school of Stockholm, which is of university grade, and hence classed with the higher institutions.

To the general class of professional schools belong also the schools of commerce which are under private management, the schools for instruction in gymnastics, and the schools of navigation. The latter number ten, with about 700 pupils. State expenditure reaches 100,000 kronas annually. Extended provision is also made for instruction in agriculture, forestry, and the veterinary art, the state contributing annually to this provision about 560,000 kronas. The fine arts are promoted by the Art Academy and the Conservatory of Music, both at Stockholm and partly supported by the state.

Universities. — To matriculate at the university, the student must have passed the higher secondary school examination (*studentexamen*). There are three state universities, viz.: Upsala, Lund, and the Caroline Institute at Stockholm, and two private universities, viz.: the high school of Stockholm and the high school of Gothenburg.

The universities of Upsala and of Lund have each four faculties, viz.: theology, jurisprudence, medicine, and philosophy. The last is divided into a section of humanistics and a section of mathematics and natural sciences. The Caroline Institute is a medical faculty. The high school of Stockholm includes a faculty of law and political science and a faculty of mathematics and natural sciences; the high school of Gothenburg merely the faculty of humanistics. The academic year lasts from the beginning of September to the close of May. P. E. L.

UNIVERSITY STATISTICS, 1911

Name	Date of Foundation	Number of Students	State Subvention or Entire Income	Equivalents in United States Currency
			Kronas	
Upsala	1477	2261	835,000	$235,000
Lund	1666	1162	718,000	225,348
Caroline Institute	1571; 1815	307	357,000	102,102
High School[1] (Stockholm)	1878	562	[2] 313,663	89,707
High School[1] (Gothenburg)	1887	[3] 190		
Technical School[1] (Stockholm)	1844; 1878	400	830,000	237,380

[1] University rank. [2] Income.
[3] Of these 23 are women; also over 1701 auditors not matriculated.

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SWEDENBORG AND EDUCATION. — Emanuel Swedenborg (1688–1772), was the founder of the "New Jerusalem Church," which maintains that Jesus Christ is the only God, and that sacred Scriptures must be interpreted by a spiritual sense which exists amongst angels, and which was revealed by Swedenborg. So, too, man is a spirit clothed with a material body suited for man's work in this world, whereas the spirit is especially fitted for its abode in the spiritual world. While, therefore, Swedenborgians are warm supporters of education in the ordinary acceptance of the term as applying to the earthly life, they lay stress on the continuity of the spirit in its heavenly home after this life and regard spiritual education as of still higher importance. Hence the New Church doctrine of degrees, the science of correspondences of natural with spiritual things, and the spiritual sense of the Bible — the *Arcana Cœlestia* — are of the first educational importance.

Swedenborg regards the human mind "as a house of three stories communicating with each other by means of stairs, in the highest of which dwell angels from heaven; in the middle, men from the world; and in the lowest, genii." Under certain conditions "man has power to ascend or descend at pleasure." The child up to four or five years of age is occupied with sense-derived ideas or the picture-stage. After five he proceeds to active imagination, which passes readily into the memory and reading stage of knowledge. Having passed through the sense-stage and the memory-stage, he enters on the third stage, viz. the rational. All school and academic education, therefore, helps to take the pupil to the third story of the mind, *i.e.* to the thinking stage founded on a knowledge of the sciences. It is the mode of acquiring knowledge, not its quantity, which raises the intellectual caliber of the student. The good teacher is not content that his pupils acquire knowledge. He wishes to arouse the love of knowledge. On the moral side, educators must build up the rational mind in pupils so that the pupil can dispense with reliance on the teacher's rational mind. "The effect of a sound education ought to be to educate the young to the same level of freedom and rationality which is enjoyed by their educators; and when they have reached that level they are in the charge of the Lord alone and His truth, and He continues the process of education which is now called regeneration." The aim of education may thus be said to be that the natural man should be so spiritualized that he becomes an angel. The great principle of education of the individual is the literal fulfillment of the injunction: "Be ye therefore perfect" — by a process, in a line of evolution, earthly and heavenly, in absolute continuity. The later Nietzschean idea of the Superman is not some being to be produced by a long process of generations but the natural birthright of every human being who obeys the commands of God, in which consists all salvation, earthly and heavenly. Education, therefore, proceeds after the death of the natural body, according to the stage reached on earth, of the child, youth, or adult, and is under the charge of angels and under "the Lord's auspices." All the angel-masters have special qualifications and communicate instruction exactly suited to enable scholars to become more intelligent, according to their dispositions and powers of reception. The end constantly kept in view by angelic teachers is the "love of use," *i.e.* pupils learn what will enable them to render services to others. "Use," says Swedenborg, "consists in a person fulfilling his duty and acting in his employment uprightly, faithfully, sincerely, and justly." Every one in heaven is a worker, and to be of some use is "the very breath of his life." One of the chief "uses" of angels is to "instruct and to teach spirits coming from the world," and apparently in the processes of suggestion to act as guardian angels to those who are on earth. Truth perceived becomes a "good" when translated from thought to action, and it is *the will* "which causes that to become good which before was truth." Spiritual education, therefore, is essentially the conversion of intellectual insight into actions of the good will.

The realism in Swedenborg is as marked as in Comenius (*q.v.*). The doctrine of the continuity of the evolution of the material body in the environment of the material world leads to the continuity of the spiritual part of the individual (at any rate after the death of the material part) in a spiritual heaven, as realistic as the material world of earth. The successive vistas of spiritual education give a magnificence to Swedenborg's philosophy of education probably unparalleled in its outlook among speculative educationalists. F. W.

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SWEDISH GYMNASTICS. — See Gymnastics; Ling; also Calisthenics.

SWIFT, JONATHAN (1667–1745). — Dean of St. Patrick's, Dublin, the great satirist of the first half of the eighteenth century, cousin of John Dryden, was educated at Kilkenny Grammar School from 1674 to 1682. He then went to Trinity College, Dublin, where he stayed till 1688. He was "stopped of his degree for dullness and insufficiency," but received the B.A. by "special grace." On leaving college he came under the patronage of his relative, Sir William Temple. In 1694 he returned to Dublin, took priest's orders, and secured a small living, but in 1696 returned to Sir William Temple at Moor Park in Surrey and stayed with him till Temple's death in 1699. Swift was then given a prebend in St. Patrick's, Dublin, and made D.D. of Dublin University in 1701. He came to London in 1705–1707 and became acquainted with Addison (*q.v.*), Steele, and others. He wrote under the name of Isaac Bickerstaff in a paper-war with Partridge, the almanacmaker, 1709, and the pseudonym survived in the pages of the *Tatler*, to which Swift contributed. In 1713 Swift became Dean of St. Patrick's. He died in 1745, and had placed on his tomb in St. Patrick's the inscription written by himself: *Ubi sæva indignatio ulterius cor lacerare nequit.*

As a satirist, Swift was the Erasmus of his generation, and, like Erasmus, in his satires managed to contribute, at least negatively, his views of educational effectiveness and progress. Like Erasmus, he was keenly antagonistic to pedantry in learning, and particularly that in connection with religious questions, *e.g.* that of the intellectual "deists." Dissenting bodies and the pretensions of the Church of Rome are attacked, and even his own Church of England is only "let down gently." These matters are dealt with in Swift's *Tale of a Tub*, written about 1696 and published in 1704. Somewhat like Erasmus in his *Moriæ Encomium*, Swift designs a "panegyric on the world and a modest defence of the rabble." He suggests occupation for the whole race of pedants and self-fanciers in repelling his attacks instead of causing their wonted mischief on the public at large, as a tub is thrown overboard to distract the attention of a whale away from a ship. He suggests an Academy to hold 9743 persons, the number of the clergy with livings at the time, or, as he says, the estimated number of "wits." In the Academy was to be a "large pæderastic school, with French and Italian masters. There is also the Spelling-School, a very spacious building; the School of looking-glasses; the School of swearing; the School of critics; the School of salivation; the School of hobby-horses; the School of poetry; the School of tops; the School of spleen: the School of gaming; with many others, too tedious to recount." The classes of persons attacked are almost as comprehensive as those attacked by Erasmus; religious bodies, skeptics, British orators, critics, learned men, writers, philosophers. Finally, self-seeking philanthropists are ridiculed by his *Project for the Universal Benefit of Mankind.* Together with the *Tale of a Tub* (1704) was published the *Battle of the Books* in which Swift loyally supports his patron Sir William Temple in the controversy with Richard Bentley and William Wotton in their *Reflections upon Ancient and Modern Learning* (1697).

In 1726 was published the best known of all Swift's works, *Gulliver's Travels.* As the *Tale of a Tub* reminds the reader of Erasmus' *Moriæ Encomium*, *Gulliver's Travels* recalls Sir Thomas More's *Utopia* and Cervantes' *Don Quixote.* The first two parts — the Voyage to Lilliput and the Voyage to Brobdingnag — have been the delight of children as well as of adults, and the realism of the imaginary characters places the work along with the *Robinson Crusoe* of Defoe. Implicitly, there is much that is educational in the *Travels.* In connection with girls' education, it must be remembered that Swift educated Esther Johnson (Stella) from the age of seven onwards.

For the rest, educationally, Swift wrote *An Essay on Modern Education*, an appeal to the nobility to take the education of their children more seriously; a *Treatise on Good Manners and Good Breeding*; a *Proposal for Correcting and Improving the English Tongue*, and the satirical *Critical Faculties of the Mind.*

F. W.

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SWIMMING. — This exercise has a very large educational value. As an exercise it is unexcelled, for it favors harmonious development, increases strength and endurance, and tends to produce erect and graceful carriage. The practice of swimming tends to develop self-reliance and courage, and fits the individual for self-preservation and service to others in emergencies. Such an important branch of education should be included in the prescribed curriculum of the elementary school and not left to fortuitous education. The ability to swim is acquired most readily between the ages of six and ten. After ten the difficulty of learning to swim increases so rapidly that after twenty, very few persons ever succeed in mastering the art because of the increasing fear of the water and the difficulty of acquiring new coördinations.

By the old method of teaching the "breast stroke" to beginners, the average time required by young boys to learn was about six to eight lessons. Improved methods by which the "crawl stroke" is taught first, make it possible, for the best teachers to teach boys in two or three lessons. When we realize that more than 4000 men and boys are drowned in the United States and Canada yearly, that most of them had not learned to swim, and that many of them were drowned so close to safety that, had they known how to swim, they could have saved themselves, the importance of this educational problem becomes apparent.

The old Jewish law required of every father that he teach his sons two things, a trade and swimming. In Greek physical education swimming was considered one of the important branches, but modern systems of education give very little recognition to the subject. Some European cities provide facilities for teaching swimming to school children but there is no effort to give it a definite place in the curriculum. In America swimming has been left almost entirely outside of the public school curriculum. There are indications in some quarters that leaders in education recognize the need for development in this direction; Brookline, Mass., is providing regular instruction, in a well-equipped municipal natatorium, to all school children. The Boston board of education announced recently that all children should be required to know how to swim before graduating from the public high schools. Unfortunately the school board does not provide facilities for instruction and examination in this subject; the requirement under these conditions cannot bring about the best results.

In the colleges the teaching of swimming has made rapid progress in recent years. Many colleges have built swimming pools, and a number, among them Columbia, Amherst, Cornell, and the University of Pennsylvania, prescribe swimming as a requirement for graduation in the undergraduate departments. Less than 60 per cent of college freshmen can swim when they are admitted to college. Swimming is growing in popularity as a college sport. Intercollegiate and intracollegiate competitions are held during the winter months, culminating in the intercollegiate championship competition held late in March. The programs for these contests include the following events: Swimming, 50 yards; swimming, 100 yards; swimming, 220 yards; plunge for distance; diving contest; and relay race (teams of four men).

G. L. M.

SWINTON, WILLIAM (1833–1892). — Author of textbooks; was educated at Knox College, Canada, and Amherst College. He taught in secondary schools in North Carolina and New York and was professor in the University of California. He was the author of a score of schoolbooks, including readers, spellers, grammars, histories, geographies, etc.

W. S. M.

SWITZERLAND, EDUCATION IN. — **Federal Action.** — Switzerland, with an area of but 15,976 square miles and a population of 3,741,971, has been able to maintain a creditable position in the economic struggle with larger and more powerful neighbors by providing each of its subjects with the highest possible education.

The Swiss Federal Constitution of May 29, 1874, Article 27, provides for the organization of schools and by popular vote of Nov. 23, 1902, there was added Article "27 bis," which established the obligation of the federation to subsidize primary schools. The text of these articles is as follows:

> ARTICLE 27: The Federation is empowered to erect, in addition to the existing polytechnic school, a university and other institutions for higher education, and to subsidize such institutions.
>
> The Cantons are bound to provide sufficient elementary education, the management of which is in their own hands. Such education is compulsory and free in the public schools.
>
> The public school education shall be of such a nature that the adherents of all creeds may attend them without injury to freedom of faith and conscience.
>
> Special measures will be taken with regard to Cantons which do not comply with these obligations.
>
> ARTICLE 27 bis: Grants are made to the Cantons, to enable them to fulfill the duties incumbent upon them with regard to elementary education. The amount is fixed by law. . . . The organization, management, and supervision are in the hands of the cantonal authorities, but without prejudice to the regulations contained in Article 27.

The resident population, according to the federal census returns, is to be taken as the standard by which the amount of the annual contribution to the cantons is regulated, the uniform rate for each canton being sixty centimes (twelve cents) per head. Owing, however, to the special difficulties with which eight of the cantons have to contend, a supplementary grant of twenty centimes (four cents) per head was to be accorded them. On the basis of the resident population on Dec. 1, 1910, the federal subvention amounted to $405,300 for that year. By placing at the disposal of the cantons more abundant means for elementary school education, the growth of the system is encouraged and in many places its development is promoted to an extent impossible without government aid.

An immense impulse was given to the Swiss educational system by the military organization of 1875, requiring recruit examinations. The keen rivalry between the cantons to acquit themselves with honor in the examinations to which youths about to enter on their military service must submit, has necessitated the extension of the cantonal school organization and has directed the attention of the cantons to matters connected with national and continuation schools. The school period in the elementary schools has been lengthened in many cantons, and the continuation schools and preliminary courses for recruits in a steadily increasing number have been declared compulsory.

Vocational training in the cantons has also received a decided impulse from federal aid. The decisions of the government regarding the promotion of (*a*) arts and industrial training, (*b*) domestic and vocational training of women, (*c*) commercial education, and (*d*) agricultural education, have resulted in the granting of subsidies by the state to enterprises and institutions concerned with the furtherance of such means of education. The federal government has given liberally, the subventions for vocational (technical) education in 1910 having amounted to nearly three million francs ($600,000), not including the expenditure for the Polytechnic Institute at Zürich.

To the federal grants is generally attached the condition that the cantons and districts, corporations and individuals, also contribute. The government grant amounts usually to half the sum contributed by other sources. By the active support of the confederation in the last decade or two, the number of institutions, schools, courses, and measures adopted for the promotion of vocational training have increased enormously. At the same time the expenditures for the entire system of education have increased more than threefold as the following statement shows: 1886, $5,460,000; 1890, $6,510,000; 1895, $7,803,000; 1900, $10,337,000; 1905, $13,510,000; 1907, $14,398,000; 1908, $16,405,000; 1909, $17,563,000; 1910, $17,254,000.

In addition to generous financial help, two important services have recently been rendered by the confederation to popular education, *i.e.* the construction of the Swiss school wall-map and its presentation to the schools, and the Swiss school atlas for secondary and intermediate schools, published by the Conference of Cantonal Educational Authorities in 1910.

The Educational Systems of the Cantons. — Apart from the principles laid down in the constitution and laws of the country, each of the twenty-five cantons is absolutely autonomous in the arrangement of its school system, and the cantons have accordingly adapted their systems to their own requirements; at the same time the systems present many similar features. In several cantons there is a chief director of education deriving his authority directly from the cantonal council, or legislature, and assisted by an adequate official staff. In other cantons a department of education is formed by appointment of the civil council, and its executive head may be a member of that legislative body. There are district and communal boards or committees in charge of the educational affairs of their immediate areas, in particular, the matter of school attendance, the location and equipment of schools, etc.

The direct school superintendence is exercised in nearly all the cantons by professional inspectors; in a few, however, it is left to the members of the department or of the local committees, who are generally business men. Efforts are being made to extend the field of activity of the professional and salaried inspector. It is recognized that he has better understanding of school management and is in a position to give the necessary advice and instructions because of his scientific attainments and special training.

The tendency to centralized control is marked in some of the cantons; in others the opposite tendency prevails. Thus Zürich, the largest of the cantons, has no cantonal school inspectors. The executive head of the system is the educational director appointed by the cantonal council (legislature) and assisted by a special board of six members, two of whom represent the teaching profession — one of these the primary grade (*Volksschule*); the other the middle schools. This canton is organized into eleven school districts (*Bezirke*) each having an educational committee of at least nine members who visit all the schools of the district and look after such matters as school attendance, condition of the buildings, etc. They are paid at the rate of $1.60 a day for actual service. The districts are subdivided into "circles," each of which must establish at least one higher grade school (*Sekundarschule*) under its own committee. Every commune in the canton also has its school board (*Gemeindepflege*).

The other cantons are divided into similar areas of school administration, but as a rule the central director has more authority than in Zürich. In general the different orders of schools, primary, secondary, etc., have their separate committees or boards of directors, but in a few cantons a single board directs the cantonal system, for example, in the cantons of Berne and Lucerne. Where this unification exists, the direct supervision of the schools is generally committed to professional inspectors. Berne employs twelve inspectors of primary schools at annual salaries ranging from $720 to $900 and six inspectors of secondary schools at salaries ranging from $1100 to $1400. Special inspectors are generally employed for the manual arts. The instruction in domestic arts and industries for girls is supervised as a rule by inspectresses, experts in their subjects.

Primary Education. — The system of primary education includes: infant schools; elementary schools for the compulsory school ages; continuation schools; and recruits' preliminary courses (after the school age).

Kindergarten. — The educational institutions for children from four to seven years of age are infant and kindergarten schools. In the main these are conducted according to the Froebelian principles. In the German-Swiss kindergarten schools, reading, writing, and arithmetic and all other school subjects are excluded from the plan of study, but these subjects are taught in the infant schools of French-Switzerland. In the legislation relating to these institutions, their special subject is stated as the "preparation for the elementary school." A large number of districts have raised the kindergarten and infant schools to the position of communal institutions.

Compulsory School Age. — In 13 out of the 25 cantons, the minimum age of entry in the elementary school is 6½ years; in 9 cantons 6 years; and in the other 3, 7 years. The school year begins usually in the month of May, but in a few cantons in October. The number of school years (daily tuition) ranges on an average from 7 to 8; only in three cantons are there 9. There is at present, in 8 cantons, a compulsory "repetition" school, which directly follows the day or elementary school. The duration of attendance at this school is on an average 2 years, the sessions occupying no more than two half days a week.

In view of the compulsory nature of the elementary school, Article 27 of the Federal Constitution provides for *free* instruction in the cantonal elementary schools. A large number of the cantons have decided that free education entails the free supply of schoolbooks, maps, etc., as well as stationery. In consequence, more than half of the public school children receive these requirements free of charge. In six cantons, too, the utensils and the materials for needlework are given gratis.

Continuation Schools, Compulsory and Optional. — All the cantons without exception have furnished opportunity for the young people, during the period between the termination of their elementary school and their entry into industrial or business life, to refresh their knowledge in some particular direction. The method of attaining this object varies greatly in the different cantons, and for this reason the continuation school is variously organized. As a rule, the cantons allow a rest of one to two years between the completion of the elementary school and the commencement of the continuation school, partly to prevent brain-fatigue, but particularly that the pupil may approach his new duties with the advantage of additional age and experience.

The expression "continuation school," in a large number of German-Swiss cantons, has acquired a specific meaning. It is used to designate institutions which go beyond the limits of the actual elementary school, and which receive pupils who have terminated their fourteenth, fifteenth, or sixteenth year. In other cantons, the hours of tuition are almost entirely confined to the winter courses, and as a rule do not exceed three to six hours a week. In consideration of the shortness of the term of study, only the most important subjects of the elementary school course can be reviewed, special attention being given to those acquirements which are of greatest value in practical life. Thus the curriculum includes languages, arithmetic, writing, and national history. In courses in which the question of vocation is considered, other branches and groups of branches are added in schools organized on a wider basis, and in these the tuition is carried on all the year round.

To the class of complementary or continuation schools belong the short-term rural schools for the instruction of girls in household arts and in cutting and making garments. These practical subjects are supplemented by a review of the elementary branches with some extension. Attendance upon continuation schools is compulsory in thirteen cantons, and practically so in four others. Attendance upon the preparatory courses for recruits, which are included in the class of continuation schools, is compulsory in fourteen cantons.

Teachers. — The teachers of primary schools are generally graduates of a training school, but this is not invariable. In every canton, however, candidates for teachers' positions must pass an official examination, must be not less than eighteen years of age, and must present testimonials as to character. The high efficiency of the Swiss primary teachers is proverbial, and standards maintained in this service and in that of the higher vocational schools have led in some cantons to a demand for training colleges for professors of secondary schools.

The reports of the cantonal boards of education for several years past have shown a scarcity of qualified teachers, and this circumstance, taken with the continual rise in the price of all the necessaries of life, has led in several cantons to new legislation relating to salaries, and in others to an additional subvention. The average annual salary in primary schools ranges from $560 to $753. In almost all the cantons, a sick fund is maintained for teachers, as well as a pension fund.

TYPICAL PROGRAM OF PRIMARY SCHOOL (CANTON OF GENEVA)

Class of School and Normal Age Limits	Weekly Time Table officially Sanctioned						
		Year					
	Boys' class	1	2	3	4	5	6
Primary ages 7 to 13	Mother-tongue: Object-lessons	—	—	—	—	2	2
	Mother-tongue: Reading and Recitation	9	9	9	11	2	2
	Mother-tongue: Redaction, Orthography, Grammar	—	—	—	—	5	5
	Arithmetic	2½	3	3	4	3	3
	Geometry	—	—	2	2	2	2
	German	—	—	—	—	3	3
	Geography	—	1½	2	2	2	2
	History	—	—	—	—	1½	1½
	Drawing	3	3	4	3	3	3
	Caligraphy	1½	1½	1½	1	1	1
	Gymnastics and Games for Lower Classes	6	4	3	3	1½	1½
	Singing	2	2	1½	1	1	1
	Manual Work	6	6	4	3	3	3
	Total class periods	30	30	30	30	30	30

Middle Schools. — On account of the different systems of the various cantons, the schools above the elementary grade cannot well be comprised under any single term. In many cantons the primary school is followed by an advanced city or district school, *Sekundarschule*, which is characterized by the introduction of algebra and one or more foreign languages. The program is generally so arranged that pupils may enter the higher school from the fourth grade of the primary school. For convenience, schools of this type may be classed as lower secondary or middle schools. Above these are the *Mittel und Berufsschulen* (higher middle and technical schools) comprising institutions that offer courses of instruction beyond the scope of the primary and lower secondary schools and extending up to the age (eighteen or nineteen years) fixed for admission to the universities and the Polytechnic Institute. Under this head are classed normal schools or teachers' seminaries, higher schools for girls, gymnasia (classical schools), progymnasia, real schools, colleges, lycées, and technical and commercial schools of the secondary type.

The influence of both German and French models is seen in the varied names and types of the higher secondary schools for general culture. In some places there are separate institutions corresponding to the German gymnasium and real school; in others parallel courses, classical and scientific, are maintained in the same institution. The scope of these schools is illustrated by the program of a Geneva college given below, and by the ages for which they are intended as shown in the table presenting the classification of schools by age periods in typical cantons. The work of each year of the course is usually tested by an examination which determines the fitness of the pupil for promotion. The diploma of secondary studies (certificat d'instruction secondaire or maturitäts prüfung) is conferred with much ceremony upon pupils who complete the course of study and pass the final examination. The fees in the middle schools whether for general culture or for technical training are not high. Sixty or seventy francs a year ($12 to $14) is a common rate, and provision is made for free tuition in cases of need.

No general statement can be given respecting the requirements for professors of middle or secondary education; as a rule they are university graduates, and the traditions of the service as well as the examination requirements for students promote thorough instruction; at the present time, however, the need for more definite professional standards as a means of maintaining secondary education in Switzerland on the same level as that of France and Germany, is very generally recognized.

The following table shows the classification of schools by age periods in six cantons selected as typical.

CANTON	INFANT SCHOOLS 1910 PUBLIC AND PRIVATE	OBLIGATION OF SCHOOL ATTENDANCE	CONTINUOUS ATTENDANCE THROUGHOUT DAY	COMPLEMENTARY SCHOOL	SECONDARY SCHOOL[2]	MIDDLE SCHOOLS		POPULATION
						Lower	*Higher*	
		Ages	Ages	Ages	Ages	Ages	Ages	
Berne . .	69	6–15, 14[1]	6–14, 15[1]	—	10–12, 16[1]	10–14, 15[1]	14–18 18½	612,744
Zürich . .	154	6–16	6–12	12–15	12–15	12–15	16–18½	500,679
Geneva . .	103	6–15	6–12	12–14	—	11–14	14–18	154,159
Lucerne . .	8	6,[1] 7–17	7–14	14–16	12–14	12–14	14–18	166,782
Uri . . .	3	7–15	7–13	14–15	12,[1] 13–14, 16[1]	13–16	16–19	22,055
Zug . . .	3	6–15	6–12	13–15	13–15	12–14	14–18	28,013

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[1] If not legally exempt.

[2] *Sekundarschulen* corresponding to the French *écoles primaires supérieures*, but tending to become assimilated to the lower middle schools.

SWITZERLAND — CANTON OF GENEVA

CLASS OF SCHOOL AND NORMAL AGE LIMITS	OFFICIAL PROGRAM, SECONDARY SCHOOL WITH WEEKLY TIME TABLE								
	HIGHER DIVISION								
	Subjects	*Classical Section*				*Science Section*			
		Classes				Classes			
		IV	III	II	I	IV	III	II	I
Secondary Geneva College ages 12 to 18	French	3	3	3	3	4	4	4	3
	Latin	7	7	6	6	4	4	4	4
	Greek	7	7	6	5	—	—	—	—
	German	3	3	3	3	5	5	5	5
	English	(2)	(2)	(2)	(2)	3	3	3	3
	History	3	3	3	3	2	2	2	2
	Geography	2	2	2	—	3	3	2	—
	Mathematics	4	4	4	3	4	4	4	3
	Elocution	—	—	—	1	—	—	—	1
	Cosmography	—	—	—	1	—	—	—	1
	Natural Science	2	2	—	—	3	3	3	—
	Physics	—	—	2	2	—	—	3	3
	Chemistry	—	—	—	2	—	—	—	3
	Philosophy	—	—	1	2	—	—	1	2
	Political Economy and Law	—	—	—	—	—	—	—	2
	Accountancy	—	—	—	—	1	1	—	—
	Drawing	—	—	—	—	2	2	2	2
	Total class periods	31	31	30	31	31	31	31	32

From the following table it will be seen that the number of students in all classes of institutions below the universities in 1910 was 792,168. Of this number 538,286, equivalent to 14 per cent of the population, were in the regular primary schools. The additional enrollment in complementary and lower secondary schools, viz. 148,690, would bring this proportion to 18 per cent. These statistics are emphasized by the fact that there is practically no illiteracy in Switzerland.

Expenditures. — The total expenditure for education in Switzerland in 1911 amounted, in round numbers, to 89,400,000 francs, or, exclusive of capital outlay, to 87,500,000 francs ($16,887,500). This expenditure is met by Federal subventions, cantonal and local funds, tuition fees and private contributions. In general the highest scientific and technical education is supported by the federation acting as a unit; the universities depend chiefly upon cantonal funds; higher secondary education also derives its support mainly from the cantons, although municipalities contribute freely to the support of their local schools of this order; the cost of primary education is borne chiefly by the communes, but the cantons aid in the support of the higher primary and lower secondary schools. Of the total current expenditure (87,500,000 francs) the communes supplied 48.2 per cent; the cantons, 44.1 per cent; and the federation, 7.7 per cent. The cost of primary education was 55,800,000 francs ($10,769,400), of which the communes supplied 60 per cent, including the federal subvention, and the cantons 40 per cent.

TABLE SHOWING NUMBER OF SCHOOLS BY CLASS, DISTRIBUTION OF PUPILS, AND PARTIAL DISTRIBUTION OF TEACHERS IN 1910

Class	Number of Institutions	Number of Pupils	Number of Teachers
Kindergarten	1159	51,597	1505
Primary schools	4701	538,286	12,182
Continuation schools (Repetition and industrial)	3430	[1] 92,587	
Lower Secondary	652	56,103	2052
Higher Secondary			
Higher schools for girls	12	1901	
Gymnasia		9615	
Teachers' Seminaries			
Public	34	3645	
Private	14	692	
Technical and vocational		13,067	
Private and special schools			
a. For general education	306	14,157	952
b. Reform schools	69	2961	117
c. For the deaf and dumb and the blind	19	834	
d. For the weak-minded	29	1028	
e. For orphans	38	671	
f. For epileptics	1	45	4
g. For mission workers	3	197	21
h. Conservatories of music	8	4782	

[1] Also 9226 in the special classes for recruits.

Commercial and Technical Education. — Switzerland is characterized by the ample provision made for commercial and technical education, the specialized character and thorough organization of the schools of the two classes, and the coöperation of federal and cantonal authorities in their support. Federal aid is extended in recognition of the national importance of the provision and in a way to direct and standardize the schools; commercial and industrial rivalry stimulate the activity of the cantons in this respect. Commercial education naturally assumes a more uniform character than technical education, which is as varied as the industries to which it pertains. Hence the former illustrates more fully than the latter the growth of the national idea, which is very significant in view of the excessive spirit of local independence in regard to education. The cantons long resisted the proposal for a general subsidy in aid of primary schools and only yielded upon a legal guarantee that federal control should be limited to the application of the funds allowed. Similar opposition was recently excited by the proposal to institute a federal diploma in commercial education. This also subsided and the measure was adopted.

Secondary Technical Schools. — It would be impossible here to enter into particulars with respect to the middle schools of a strictly technical character. They are distinguished by the length of the course, usually six years, covering the ages twelve to eighteen, by very full equipment for their respective specialties, and by the rigid nature of the final examinations. The group includes six technical schools, eleven industrial art schools and schools of design, eight polytechnics, and above eighty specialized trade schools. The commercial high school and higher schools of agriculture and domestic arts also belong to this group. Of the single trade schools one of the best known is the municipal school of horology at Geneva, which is maintained by the city with the aid of federal subsidy, private donations, and school fees. While the chief feature of the school is watchmaking, it trains a class of workmen and workwomen competent to undertake all kinds of fine mechanical work, including the manufacture of instruments of high precision.

The cantonal industrial school at Winterthur, Canton of Zürich, affords a very fine example of the intermediate grade of technical education by means of theoretical and practical instruction. It comprises nine different sections all well organized under a general director who is appointed by the educational council of the canton upon the recommendation of the supervising committee of the school. The convention of teachers (*Lehrerkonvent*) over which the general director presides, decides upon the general plan of instruction, the coördination of parallel classes, etc. Regular students (boys and girls) must be at least fifteen years of age for admission to the lowest class and must pass an examination. Even then they are not accepted until after a probationary period of three months. The school fees are thirty francs ($6) per semester with from ten to twenty francs for the use of apparatus.

The full extent of the provision of secondary technical schools may be inferred from the table showing the distribution of students. The somewhat detailed account of commercial education which follows not only indicates the great importance attached to this provision but also the manner in which the federal government fosters the various forms of specialized schools.

Commercial Education. — *Grants from the Federal Government.* — By means of grants the federation aims at raising the standard of commercial education and enabling Switzerland to resist the keen competition of the foreigner. Petitions for federal subsidies to commercial schools, as well as to mercantile associations, must be presented every year before the 15th of August to the Swiss Department of Commerce for inclusion in the preliminary estimates of the confederation. This must be effected through the medium of the cantonal governments, whose duty it is to test and approve these petitions. In the subsidizing of commercial schools only those are considered, as a rule, at which pupils who have terminated their fourteenth year are received; which carry on the instruction in at least three successive yearly courses, or which pledge themselves to a curriculum of at least three yearly courses. By a new regulation of June 20, 1907, intended to promote to the utmost the thoroughness of the tuition, at least in commercial and linguistic subjects, the number of pupils in a class must not, as a rule, exceed twenty-four. This last regulation holds good also for the mercantile secondary schools (*Kaufmännische Fortbildungsschulen*). Petitions presented for the first time by mercantile associations, etc., must embrace the following points: (1) statements of the organization of the courses; (2) the budget of the subsidized year of management; (3) the guarantee that subscriptions are assured to the associations from other quarters (canton, district, etc.). The Department of Commerce reserves the right to inspect at any time convenient to itself the working of the institutions subsidized by the federation and the manner in which the sums allotted have been applied. The payment of the government grants to the petitioner is effected through the cantonal governments. The laws governing the subsidizing of institutions which promote commercial education were revised Jan. 22, 1909, and it was provided that after that date not only commercial high schools with three-year courses, but also commercial schools with one- or two-year courses should be entitled to a federal grant irrespective of whether they are independent or connected with a higher commercial institution.

At the head of the elaborate system are four superior commercial schools subsidized by the federal government. These are the commercial departments in the universities of Fribourg, Neuenburg, and Zürich, and the commercial high school of St. Gall. The latter recently added a special course for the training of prospective commercial school teachers. The number of students in these four schools in 1910 was 310 (298 men and 12 women), against 279 (278 men) in 1909. The total expenditures amounted to $34,386, the federal grant having been $10,017. $3062 was received from school fees; the remaining income was derived from cantons, districts, etc.

The Department of Commerce has agreed to the proposition of issuing a federal diploma to graduates of commercial high schools and other commercial schools, provided their curriculum corresponds with that officially prescribed. The measure went into effect in 1912.

Secondary Commercial Schools. — Federal grants to these schools in 1910 amounted to $53,386, against $49,801 in the previous year. Of this amount, 81 schools of the 86 sections of the Swiss Commercial Union received $45,732 and other single associations and district secondary schools, 28 in all, received $7654. The subsidies paid by cantons ($22,551) and political counties ($17,253) to the schools of the Swiss Commercial Union show a tendency to increase, but they are still out of proportion compared with the federal grants.

The sum of $10,808 (1909: $12,333) was expended by the government for various purposes, among others, $5017 for 165 scholarships; $1630 for libraries and lectures; $1747 for commercial apprentice examinations, and further small amounts for inspections, premiums, etc. The "commercial apprentices' examinations" are held under the supervision of the government, and in nine cantons are compulsory. The number of commercial schools subsidized by the federal government steadily increases; it was 6 schools with 407 pupils in 1892 and 31 schools with 3762 pupils in 1910. Of the latter schools, 6 were for boys only, 11 for girls, and 13 for both sexes. The total amount of the subsidy in 1910 was $90,931, or nearly one fourth the total expenditure for the schools, *i.e.* $336,824. The chief local commercial schools are the Zürich cantonal school, the largest in Eastern or German-speaking Switzerland, and the commercial high school at Lausanne, in the Western or French-speaking section.

The Swiss Commercial Union was founded in 1872 and of the 14,000 members in the twenty-five cantons of Switzerland, 2000 come from the single canton of St. Gall. In almost every trade center throughout the entire country the union has established commercial schools, where at slight cost may be acquired a knowledge of commercial geography, a familiarity with modern business methods and a "speaking acquaintance" with foreign languages. Courses of lectures by public men, litterateurs, lawyers, travelers, and leading manufacturers inform the members on public questions and events and all that pertains to the intellectual and practical life. The union has won its most pronounced success in the optional apprenticeship examinations, which are public and which have been generally introduced throughout Switzerland. These examinations are part of a carefully prepared program, having in view the thorough and uniform training of the future tradesmen. In 1910 the number of sections of the association had reached eighty-six with a membership of 16,000. In addition to promoting commercial education, the sections conduct employment bureaus. The government grants an annual subsidy to the association which in 1910 amounted to $54,250.

Museums. — The equipment of the commercial and technical schools includes abundant illustrative material and the museum adjunct contributes greatly to the efficiency of the instruction. The St. Gall Industrial and Commercial Museum, which is one of the most admirably appointed, is devoted especially to the interests of the embroidery trade and forms as it were a link between the commercial and the industrial schools of the city. Established in 1878 by a combination of progressive business men, it soon became a recognized factor in the development of the city's chief industry. Aided for a time by liberal donations from the board of trade and by cantonal subventions, it has finally become self-supporting. It comprises schools of instruction in the manufacture of textiles, designing and enlarging, stitching in silk and metal thread, and art schools. The museum proper has materially aided in developing the taste and perfecting the art of the Swiss designer. Much of the beauty displayed in St. Gall's laces and embroideries may be traced to the study of its models of ancient and modern handicraft.

Higher Education. — Higher education is represented by seven universities and the Federal Polytechnic Institution. The universities each comprise four faculties, excepting Fribourg and Neuchâtel, which are wanting in the medical faculty. The latest statistics pertaining to the higher institutions are given below.

UNIVERSITY STATISTICS 1911–1912 (W. S.)

Name and Date of Foundation	Teaching Staff	Number of Students	Expenditure, 1910		
			Francs		$
Basel (1460) . .	129	806	650,382	=	130,076
Zürich (1832) . .	158	1,742	1,125,644	=	225,128
Berne (1834) . .	146	1,664	1,117,555	=	223,511
Geneva (1559[1] and 1873[2]) . . .	158	1,762	951,765	=	190,353
Lausanne (1537[1] and 1890[2]) . .	121	1,227	851,841	=	170,386
Fribourg (1889) .	92	620	421,934	=	84,387
Neuchâtel (1866[1] and 1903[2]) . .	57	302	161,279	=	32,259

[1] As an academy. [2] As a university.

DISTRIBUTION OF STUDENTS BY FACULTIES
(1911 S. S.)

Faculties	Number of Students
Theology	412
Law	1560
Medicine	1801
Philosophy	3027
Total	6800

The Federal Polytechnikum in Zurich. — The only Swiss scholastic institution under the direct supervision of the federal authorities is the Federal Polytechnikum in Zürich, founded in 1864. The institution is managed by the Swiss "school board," consisting of seven members and a secretary, elected for five years. The Board elects the rector of the school and his deputy, ratifies the election of the heads of divisions proposed at the conferences and all other officials of the school, and submits to the federal council nominations and engagement of professors and assistant teachers.

The distribution of students in the various divisions of the institute in 1910 was as follows: (1) architecture, 76; (2) construction, surveying, and civil engineering, 367; (3) machine construction and mechanical engineering, 532; (4) chemistry, 204 (including 7 women); (5) pharmaceutics, 20; (6) forestry, 37; (7) agriculture, 44; (8) experts in mathematics and physical science, 24 (2 women); (9) experts in natural science, 16 (3 women); (10) general division, 13; total students, 1331 (including 12 women).

The conditions of admission and graduation in this high institution are rigidly fixed by federal regulations. Each division is authorized to confer the diploma of its specialty; the doctor's diploma is conferred by the rector upon graduates who have received a special diploma, pass successfully the prescribed oral and written examination, and submit a satisfactory thesis upon a selected technical subject.

The Federal Polytechnikum is one of the greatest institutions of its class in the world, renowned for its equipment and the high order of its teaching. As it serves the entire country, it exerts a unifying influence over the technical schools of the different cantons. This service is rendered not alone for the mechanical arts, but for the fundamental industry of agriculture. In respect to the latter, it should be stated that in the primary schools of Switzerland there is often a distinct trend of the scientific teaching toward agriculture, and that admirable training is given in the agricultural high schools. Hence students come to this division of the Polytechnikum well prepared to profit by its highly specialized departments of forestry, agriculture, or agricultural engineering.

In the large provision for training the industrial aptitudes of the people, and for fostering the higher technical professions, Switzerland exemplifies the doctrine of her great reformer, Pestalozzi; of all educational philosophers of his time, he most fully comprehended the needs and possibilities of a democratic state. A. T. S.

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SYDNEY, UNIVERSITY OF, AUSTRALIA. — An institution incorporated by an act of the legislature of New South Wales in 1850, consolidated with subsequent acts in the University and University Colleges Act of 1900. By a royal charter of Feb. 7, 1858, the same rank, style, and precedence are granted to graduates of the University of Sydney as are enjoyed by graduates of universities within the United Kingdom. The university is a corporate body composed of sixteen elective fellows and from three to six *ex officio* members, consisting of the professors of certain subjects designated by the senate. The chancellor and vice-chancellor are elected by the senate from their own numbers, the former holding office for three, the latter for one year, both being eligible for reëlection. Since 1884 women have been admitted to the privileges of the university equally with men.

There are four faculties in the University, those of arts, law, medicine, and science. Matters affecting studies and examinations which concern more than one faculty, and also matters affecting the discipline of students, are controlled by the professorial board. The faculty of arts comprises the professors of classics, mathematics, modern literature, history, logic and mental philosophy, and education, with the assistant lecturers and professors in these subjects. The faculties of law and medicine include in addition to the professors and lecturers of these faculties the respective members of the senate who are members of the legal or medical profession. The faculty of science includes not only the professors in subjects required for the science degrees, but also representatives of the departments of engineering, veterinary science, and agriculture. The registrar is *ex officio* a member of each faculty. There are boards of studies of pure science, agriculture, engineering, and veterinary science, all of which report to the faculty of science; also a board of military studies, a board for conducting the public examinations, a university extension board, and a library committee. Three denominational colleges are established within the university, namely, St. Paul's (Church of England), St. John's (Roman Catholic), and St. Andrew's (Presbyterian). The Women's College and the Royal Prince Alfred Hospital (400 beds) are also established within the university grounds. The university has many fine buildings, erected by the government of New South Wales, the main building being of brown sandstone, in the Tudor perpendicular style, forming one side of a partially completed quadrangle with a frontage of 410 feet, and having a central tower 90 feet in height.

The number of students in degree courses in 1911 was 1284, exclusive of 103 students taking special courses and individual subjects. The receipts for 1911 amounted to £67,519. The average salary of professors of the university is about £1100. The present practice of the university is to draw its professors from Great Britain, assistant professors and lecturers chiefly from its own graduates. P. R. C.

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SYLLABIC METHOD. — See Reading.

SYLLABICATION. — See Spelling.

SYLLOGISM. — According to Aristotle every real object of knowledge is a "concretion" of form and matter, or a realization of the potentialities of energy. Form and energy (or actuality) in this scheme correspond to the universal of knowledge, while matter and potentiality correspond to particulars. This is to say that the true and valid object of knowledge is the embodiment of a universal in particulars. In Aristotelian logical theory this idea was expressed in definition as giving the real nature of any subject, definition stating the genus (universal, productive energy,) and its specific differences (particulars, potentialities). These conceptions are the basis of the theory of the syllogism as the adequate and demonstrative method of perfect knowing. For the syllogism is in its essence a statement, at once analytic and synthetic, of the connection of a universal with particulars. Its model form is the statement of the universal as the major premise — Man is mortal; the statement of a particular as falling under rule of this universal — Socrates is a man; while the conclusion closes the system by making the explicit application of the generic rule to the specific case — Socrates is mortal. Three "figures" of the syllogism were discriminated, depending upon the relation of the subject and predicate to each other in the matter of drawing the conclusion; and the cases of each figure were enumerated, depending upon whether propositions were affirmative or negative and upon the way of uniting universal and particular propositions. Rules were thus laid down for all kinds of correct and incorrect reasoning, according as reasoning did or did not correspond to the models thus set forth. Since the first figure (illustrated in the syllogism regarding mortality and Socrates) was taken as the standard of the connection of universal and particular, rules were also given for the reduction of the second and third figures to the first.

Aristotle's own interest in the entire field of the sciences, and his vital sense of the real connection in nature of universals and particulars, prevented his conception of syllogistic reasoning from degenerating into merely formal argumentation. In the Middle Ages there was little or no interest in natural phenomena, and there was great interest in moral and religious conceptions based upon authority and expressed in dogmas. The major premises were thus taken bodily from revelation and the doctrines of church fathers and councils, and the syllogism became the instrument of the rational systematization of church doctrine. In the earlier period of Scholasticism (*q.v.*) the interest was constructive. After the work of systematizing theology had been performed, later Scholasticism tended to degenerate into more or less verbal disquisitions and into subtle refinements of argumentation. There was little care for subject matter and a great deal for the appearance of rigid syllogistic form. The reaction of the Renaissance and Reformation against Scholasticism tended to bring the syllogism into disrepute, and the innovators almost without exception condemned it as giving the pretended form of knowledge without its substance. The increasing interest in the particular, represented within Scholasticism itself in the nominalistic movement, and corresponding to the rising individualism of the age, fostered this disregard of the syllogism. The most severe blow to it, however, was given by the rise of physical science with its demand for accurate observation and its transfer of interest to discovery of the new rather than demonstration of the old. After a while, a compromise was worked out, according to which the syllogistic logic was accepted for deductive reasoning, while the new logic formulated the inductive method of reasoning. When it was realized that mathematics, the typical deductive science, did not depend upon syllogistic reasoning, it was necessary to give up this compromise. The best opinion at present holds that the syllogism is not so much a mode of reasoning as a way of exhibiting the result of a particular reasoning so as to facilitate the discovery of any fallacy in its course. As a way of expounding and testing the results of prior reasonings, the syllogism is likely to remain a powerful adjunct of thought.

J. D.

SYLVESTER II. — See Gerbert.

SYLVIUS, ÆNEAS. — See Æneas Sylvius.

SYMBOLISM AND EDUCATION. — Speaking broadly, a symbol is anything that has meaning. Usually, however, the term is restricted to those cases where the connection between the symbol and its meaning is relatively remote, requiring as it were some special knowledge or favorable insight to apprehend it. In this narrower sense, symbolism has been prominent in various historic systems. Pythagoras saw significance in certain arithmetical numbers and geometric forms, a circumstance that has probably not been without its effect in the development of mathematics. The neo-Platonists resorted to symbols in an effort to overcome the deficiency that has been assumed by all mystics to inhere in language and thought. During the Middle Ages, much of the teaching, both of esoteric and exoteric character, both for the narrowly selected group and for the masses, was through some form of symbolism. The medieval scholastic belief in the various methods of interpretation, the literal, the allegorical, the mystical, and the moral, called for or at least lent itself to symbolic representation. Dante (*q.v.*) is the outstanding type of this method. In a less rational way, symbolism has in every age been associated with all manner of talismanic devices and superstitious schemes. In more modern times the nascent evolutionary philosophy of the early ninetetenth century showed in the Romantic *Natur-philosophie* a wide use of symbolism. Schelling taught that Nature and Mind are parallel manifestations of the one divine spirit. "Material" things were taken to be the analogues of "spiritual" laws or principles. Oken, an ardent follower of Schelling, extended the doctrine throughout a vast range of "scientific" writings.

The educational member of this pseudo-scientific group, Friedrich Froebel (*q.v.*), probably influenced by both Schelling and Oken, promulgated the most far-reaching application of symbolism yet made in education. According to him developing (*i e.* the unfolding of latency) is the universal law of nature. The earlier stages of the process, accordingly, "point to or symbolize" the later. Again, since the unfolding of all things comes from the "divine effluence," all the instances of development are parallel and the analogous stages of any two parallel lines of unfolding "point to" each other. Thus the tree is an "absolutely reliable" teacher, from which man may learn "with certainty the thing to be done at every moment of life." Besides these organic types of symbolism, there is a third by which any material object that embodies a principle or concept becomes a symbol of that principle or concept. Thus the ball symbolizes undifferentiated unity, while the cube symbolizes unity in diversity. In these three ways Froebel saw the world shot through and through with meanings, some approaching a serious scientific status, others incredibly *outré*.

The educational bearing of this symbolism depends on Froebel's doctrine of innate ideas, in which the biological doctrine of preformation was carried over into mental life; and the child's mind contains in a very true and literal sense what is later to appear. In answer to the question as to "how such contrasted ideas and such motives, which only come into the comparing, considering mature mind, even exist in the child's dreamlike condition," Froebel answers: "We here repeat once more what we have already said elsewhere. Did it not lie in the child, did it not live and work in the child, did it not already define the child's life, it could by no means come out from it at a later period." Since ideas are thus given at birth, lying latent in the child's mind, it is the function of education to awaken these, and the means are the symbols of the sleeping ideas. "I have symbols," says Froebel, "which unlock his soul for the thought or spirit which is innate in everything that has come out of God's creative mind. If the ripened mind is to know and understand this thought, its embodied image must make an impression upon the yet unconscious soul of the child, and leave behind it forms which can serve as analogies to the intellectual ordering of things." In other words, if the child plays with the "material" symbols of any "spiritual principle," an effect is produced which prepares the way for that principle to awaken from its state of latency in the child's mind.

From this point of view the gifts and occupations are selected and arranged. The series begins with the sphere because this symbolizes not only unity, the most inclusive concept, but also the germ (the cell or seed is round), as typical of all development. The cube represents a step toward the differentiation of unity, and so with the others. Since (according to Froebel) all developing is parallel, the series of gifts (which are supposed to develop from the sphere) is parallel to the unfolding of the child's own life. There is thus a kind of Leibnitzian prearranged harmony between the geometrically deduced gifts series and the psychological development of the child's interests and capacities.

Froebel's whole discussion thus evidently assumes that a symbol for the adult is a symbol for the child, perhaps the worst form of pedagogical fallacy. At present probably few will openly defend the original Froebelian doctrine, and the tendency to give it up is steadily on the increase; but many, perhaps most, kindergartners still follow procedures which are in origin based on it. A very different thing is the fondness of the little girl for her doll and the boy for his stick horse. The adult may, to be sure, look at the doll as the symbol of the real baby that is to be fondled in later life; but this is beside the mark. The child already has the fondling instinct, and the doll allows the expression of that impulse. Symbolism proper has nothing to do with it. (See PLAY.) Similarly with other alleged uses of the symbolic in early education. A closer analysis seems to show either that such instances are symbolic only in the sense that symbolism may be ascribed to all meanings or that the case is symbolic for the adult but not for the child. Certainly symbolism proper has small place in early education.

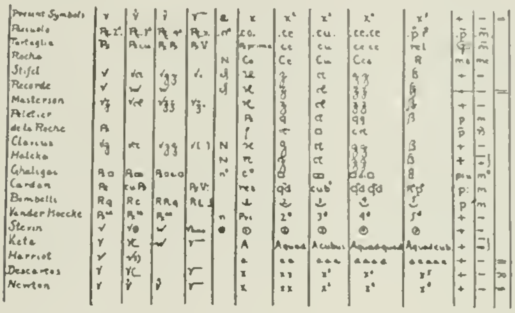
W. H. K.

See EMBLEMS; FROEBEL; KINDERGARTEN; MYSTICISM.

SYMBOLS OF OPERATION. — The common symbols of operation, such as +, −, ×, and so on, are relatively modern. Most of them date from about 1550, although a few were used even earlier. In the great work of Paciuolo (*q.v.*) there is a table of *Catteri Alghibratici* in which the symbol ℞ is used for a radical sign, followed by abbreviations of the words prima, secunda, etc.; the first two and the last of the thirty roots being written as follows: ℞. p^{a}., ℞. 2^{a}, ℞ 30^{a}. Besides using these forms, the second, third, and fourth roots are frequently written ℞., ℞.cu., and ℞. ℞., and there is still another symbol which Paciuolo calls *Radice Universale* and uses to indicate the root of a polynomial.

The Italian writers generally abbreviated *piu* (plus) and *meno* (minus) by the symbols $\tilde{p}$ and $\tilde{m}$. They called the unknown quantity *cosa* (thing) and abbreviated it as *.co.*, using

.ce. for x^2, and *.cu.* for x^3. The origin of the most important symbols is indicated in the following table: — D. E. S.



Present Symbols	√	∛	∜	√‾	[illegible]	x	x^2	x^3	x^4	x^5	+	−	=
Paciuolo	R.x.	R.r	R.R	R.v.	n°	co.	.ce	.cu.	.ce.ce	.p.r	p̄	m̄	
Tartaglia	R	R.cu	R.R	R.V		[illegible]	ce	cu	ce ce	rel	p̄	m̄	
Rocha					N	Co	Ce	Cu	Ces	R	[illegible]	me	
Stifel	√	√ce	√zz	√.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+	−	
Recorde	√	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+	−	=
Masterson	√z	√ce	√zz	√z.		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+	−	
Peletier						R	q	a	qq	β	p	m	
de la Roche	R					ſ	[illegible]	o	[illegible]		p̄	m̄	
Clavius	√z	ce	√zz	√( )	N	[illegible]	[illegible]	[illegible]	[illegible]	β	+	−	
Malcho					N	[illegible]	[illegible]	[illegible]	[illegible]	β	+	[illegible]	
Ghaligai	R o	R [illegible]	R o o o		n°	c°	[illegible]	[illegible]	[illegible]	[illegible]	piu	m°	
Cardan	R	cu R		R V:		reb	qd	cub°	qd qd	[illegible]	p:	m	
Bombelli	R q	R c	R R q	R c L		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	p	m	
Vander Hoecke	R°	R°	R°		n	Pri	2°	3°	4°	5°	+	−	
Stevin	√	√③	√	[illegible]	⓪	①	②	③	④	⑤	+	−	
Vieta	√	√C	√	√‾		A	A quad	A cubus	A quadquad	A quadcub	+	[illegible]	
Harriot	√	√3)				a	aa	aaa	aaaa	aaaaa	+	−	=
Descartes	√	√C		√‾		x	xx	x^3	x^4	x^5	+	−	∞
Newton	√	∛	∜	√‾		x	xx	x^3	x^4	x^5	+	−	=

SYMPATHY. — In addition to the popular interpretation of this term, the word has taken on a semi-technical character. We always tend to imitate any object which we observe. Thus, an object which is swinging backward and forward before an observer will arouse in that observer a tendency to move his own head or some other part of his body. This tendency to imitate contributes very largely to one's recognition of the object. We are said, therefore, to recognize the moving object through our sympathy with its movement. In the same way, when we look at a column which is carrying a weight at the top, there is a natural tendency to contribute by muscular tension to the work which the column is continually performing. We sympathize in a very proper sense of the term with even an observed object which is carrying a burden. This becomes all the more obvious when we observe a fellow human being struggling under some burden. Here we sympathize by imitating his struggles. Our recognition in both cases of the proper adjustment between the supporting structure and the weight is a part of our æsthetical consciousness, and the pleasure derived from a proper adjustment between weight and support is one exhibition of our sympathetic perception of relations. Conversely, the distress experienced when the relation is not properly adjusted is also an exhibition of sympathy. The experiences to which the word "sympathy" are applied in popular usage are of the same type. We sympathize with any animal undergoing an experience that arouses within us, as we look on, a muscular reaction or a series of memory images that permit us to interpret the subjective experience through which the animal is passing. In many cases we undoubtedly attribute to others experiences through which they are not passing. This is merely one phase of the general tendency to interpret all objective experiences as personal in character. As an extreme illustration of this fact, we find the savage attributing all sorts of subjective emotions to inanimate objects. (See MYTHS.) The tendency to personify and sympathize in an uncritical way is indicative of immaturity of experience. A refinement of sympathy through an elimination of improper interpretations of the experience of other persons or of the behavior of objects marks the development of the individual into a discriminating interpreter of objective experience. C. H. J.

See EMOTIONS; MORAL EDUCATION; also CHARACTER.

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SYNÆSTHESIA. — A term describing the very intimate sensory (or ideational) association by which an actual impression in one field calls up with unusual vividness and objective realism a more or less fantastically related impression of a different sensory order. The most common example thereof is termed "color hearing," in which the attentive perception of sounds arouses the visualization of definitely related colors. In this there is much individual difference, though marked constancy in the same individual's visualizations. Tones of a certain quality, like the several vowels, will each arouse its distinctive color field; or it may be that tones of high pitch will arouse blue, for example, and those of lower pitch red, while in the most complex cases a tone melody may in some vague and general analogy arouse a wavelike color sequence. That these connections are to be considered as by-products of the associative mechanism rather than as a directly sensory issue is well shown in the similar objectification of more purely mental constructions. Most common of these is the "number-form," in virtue of which the thinking of numbers in their serial sequence becomes projected in some constant geometrical arrangement, which in turn, in some cases, may also involve a colored projection. Similarly objectified visualizations may be associated with letters, with the month of the year, with proper names, with voices, with the positions of the hands of a clock, and so on. While not notably important in their detail, the prevalence of these persistent associations makes more readily intelligible the abnormal hallucinations of insanity, and contributes to the appreciation of individual variations and of the value of the sensory dominance in imaginative constructions. J. J.

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SYNAPSE. — See NERVOUS SYSTEM.

SYNCOPATED ALGEBRA. — The history of algebra has often been divided into three stages: (1) rhetorical, in which the work was written out in full, with no abbreviations and no symbols; (2) syncopated, in which initial letters or syllables were used, as in the case of *p* for plus, *r* for radix (root), and *min.* for minus; (3) symbolic, in which symbols are extensively used. The syncopated algebra is therefore the second stage in the development of the science. D. E. S.

SYNONYMS. — See WORD ANALYSIS.

SYNTAX. — See LANGUAGE, ENGLISH.

SYNTHESIS. — See ANALYSIS AND SYNTHESIS.

SYNTHETIC METHOD. — When the parts are first developed and the pupil then proceeds to construct or identify wholes, the teaching method is called a synthetic method to distinguish it from one where the procedure is chiefly from wholes to parts (analytic method). Thus in teaching reading to beginners, if the first units employed are letters or syllables, the study of words and sentences following, the method is said to be synthetic. If the beginning is made with sentences and phrases, words, syllables, and letters being taken last, the method is analytic. H. S.

See ANALYSIS AND SYNTHESIS.

SYRACUSE UNIVERSITY, SYRACUSE, N.Y. — A coeducational institution founded in 1870 under the auspices of the Methodist Episcopal church. The nucleus of the institution was found in Genesee College (1850) at Lima, N.Y., which contributed its faculty and a number of its students to the new institution. To the college of liberal arts thus founded was added the Geneva Medical College (1832), which removed to Syracuse in 1872. The college of fine arts was inaugurated in 1873, later removed to the memorial building erected by Mr. John Crouse in 1888. The university buildings number twenty-two in all, located on a campus of 100 acres.

The plant of the university in 1911 was valued at $3,220,500 and its productive funds as over $2,000,000. In 1911–1912 its instructors numbered 249, its students 3368, of whom 1401 were in the college of liberal arts, 1100 in the college of fine arts, 91 in the college of medicine, 239 in the college of law, 321 in the college of applied science, 89 in the teachers college, 225 in the summer school, and 41 in the library school. In 1911 the state college of forestry at Syracuse University was founded by act of legislature. The graduate school was established upon an independent basis the same year. The university library contains about 88,000 bound volumes and 47,000 pamphlets. It includes the valuable collection of the German historian, Leopold von Ranke.

SYSTEM. — When an end of considerable importance has to be accomplished by an arrangement of means and agencies of various unlike kinds, the whole is called a system. The conception closely resembles that of organization, but system excludes the notion of external arrangement and control to a greater extent than does organization. It also emphasizes to a greater degree the idea of function performed or use rendered, while organization is a more structural conception. The notion of self-maintaining order within a complex adaptation of means to an end is an idea of great value. In educational theory the importance of logical systems was recognized before that of any other kind, to such an extent that there was a tendency to neglect all other modes of systematization. Logical systems involve definitions to fix the basic concepts and a principle of classification worked out in graded fashion. The result is that a very large number of facts and ideas are arranged as a series of premises and conclusions, going by orderly steps from the general to the particular. A logical system represents the purely intellectual ideal, and serves as a norm in all scientific effort. The methods of abstraction, generalization, and classification involved in such a deductive arrangement are not, however, suited to the earlier stages of the apprehension of any subject, for they imply that the mind has already made a preliminary acquaintance with the material, and has reached a point where it has a need for its logical ordering. So-called inductive methods of education have, accordingly, reacted against the notion of logical systematization. In some cases, there was no constructive substitute, and the result was confusion and distraction. Herbart contributed the idea of psychological systems: the coherence of analogous bodies of ideas that select and assimilate without conscious abstraction and choice, congenial material. Educational thought since Herbart's time has removed the somewhat mechanical and external scheme for creating these psychological systems, found in Herbartianism, by developing the ideas of spontaneous tendencies and social influences as natural foci for the systematizing of experiences. J. D.

TABOR COLLEGE, TABOR, IOWA. — Founded in 1857 as the Tabor Literary Institute. There are maintained an academy, college, conservatory, commercial and art departments, and a summer school. The entrance requirements are equivalent to the work of a high school. The degrees of A.B. and A.M. are conferred by the college. There was an enrollment of sixty-one collegiate students in 1910–1911. The faculty consisted of eighteen members.

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Syracuse University.

TABULAR METHODS AND TABULATION. — See Graphic Curve; Statistical Method.

TACITUS, PUBLIUS CORNELIUS (*c.* 50–117 A.D.). — The great Roman historian merits a place in the history of education for the valuable light which he throws on the type of education which prevailed in his day, — the schools of declamation. In the *Dialogus de Oratoribus*, written probably in 79 A.D., Tacitus gives an account of the decay of oratory under the Empire and, since the whole aim of education was then summed up in oratory, of the decline of education. He here offers a valuable contrast between the old and the new education, the education in the days of Cicero and in his own time. Under the Empire oratorical training had become formal and artificial. In the old days the orator was not trained in the rhetorical "circus," as Tacitus terms the schools of declamation, but after a thorough liberal education oratorical skill was obtained by contact with actual life. "No man, I affirm, ever did or ever can maintain that exalted character (of a complete orator), unless, like the soldier marching to battle, armed at all points, he enters the forum equipped with the whole panoply of knowledge." The orator of former days was not brought up on barren precepts of rhetoric, but acquired the canons of eloquence by serving a period of apprenticeship to the great orators in public life. But in the rhetorical schools of his day "a parcel of boys and raw youths of unripe judgment harangue before each other, without the least fear or danger of criticism." And the themes are of a "preposterous nature," specimens of which Tacitus gives. The whole *Dialogue* is a valuable contribution on the conception of a liberal education and the needs of public life, and on the dangers of formalism and artificiality in school work.

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TACTUAL SENSATIONS. — The term tactual is applied somewhat indefinitely to all or part of the sensations that give information of the character of the objects that come into contact with the skin. These include primarily the sensations of pressure and the group of kinæsthetic impressions that fuse with them; also the temperature sensations which combine with them in some cases. The discussion of the primary sensations will be found under the suitable titles, and need not be repeated here.

See Perception. W. B. P.

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TALENT. — Any particular ability or power which a person possesses; as, for example, musical talent, or talent for mathematics.

Usually the term "talent" is used for powers or gifts which are extraordinary, while yet falling short of those rarest manifestations which we call "genius." We should feel it just to say that Shakespeare showed histrionic talent; but it would seem like damning him with faint praise to speak of his "talent" as a dramatist. Yet this limitation is of no especial psychological importance, and in the present account will be disregarded. Originally the word meant a certain standard of weight, or of money value, and came to its present meaning probably through the special application suggested in the parable of the talents in the gospel of Matthew (xxv, 14–30).

Extraordinary ability of a special kind may appear generation after generation in the same family, — as musical ability in the Mendelssohn family, or the financial gifts of the Rothschilds. Or, again, it may appear with far less clear ancestral justification, — as in the great gifts of Lincoln. Unusual powers are unquestionably bound up closely with education; for training is required for their proper expression, and a suitable situation for their encouragement. But it seems quite unwarranted to hold, as some do, that by means of education extraordinary power of whatever character might become manifest in any and every person. Rare administrative ability, for instance, probably springs from a different innate endowment from that of rare artistic power; with any conceivable training, Gladstone would probably have made an indifferent painter; while Michelangelo could hardly have attained eminence as a financier. And yet neither could have attained his own excellence in a situation that gave no play and education to his special aptitudes. This does not imply, however, that in the same person there may not be the natural endowment for more than a single kind of excellence, as is evident from the many-sided genius of such men as Da Vinci and Leibnitz.

Modern education, with its growing interest in the child whose ability is below what is normal, is also beginning to awaken to the need of special attention to those unusually gifted.

See Ability, General and Special; Genius; Individual Differences; Supernormal Children. G. M. S.

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TALLADEGA COLLEGE, TALLADEGA, ALA. — A college for negroes of both sexes founded by the American Missionary Association in 1867, chartered as a college in 1891. Besides the college department, giving the A.B. degree, and requiring fifteen credits for admission, a theological department, a normal school, and a preparatory school are maintained. Training is also given in a great variety of industrial lines. Buildings, land, equipment, and endowment are valued at over $425,000. The students number between 700 and 800 and the teaching staff over forty.
J. M. P. M.

TALLEYRAND, CHARLES MAURICE, PRINCE (1754–1838). — To Talleyrand, in his democratic days, France owed one of the finest and most practical educational schemes that was published before the nineteenth century. He was trained at the Collège d' Harcourt, in the easy and primitive curriculum then followed for the sons of the wealthy. Being then destined for the church, he studied at St. Sulpice and the Sorbonne, where he would learn as much of the new liberal culture as of the old theology. The pupil was largely left to his own resources, and the library was varied. Ability and inclination led him into the society of the more brilliant men of the pre-revolutionary decade, and he seems to have been attracted to the dream of reforming education, which was breaking on the mind of Europe, as well as to liberal and democratic ideas generally. The American envoy Morris observed, some time before the Revolution, that education was "the bee in his bonnet." He was appointed on the education committee of the Constituent Assembly in 1791, and was charged with the report to the Assembly. His lengthy paper (*Rapport sur l'instruction publique*, in Vol. LXX of the *Procès-Verbal de l'Assemblée Nationale*) is, for the time, a very remarkable scheme. Without showing much feeling for the psychological principles which were just beginning to claim recognition, he embodies the ideas of the best scholars of the time in a great democratic, and generally sound, reform of the national system. There is no serious ground for the contention that Talleyrand did not write, or at least compose, the paper.

He insists that the teacher shall develop body (by healthy conditions and gymnastics), mind (in its three faculties of imagination, memory, and reason), and character (by religious, civic, and moral lessons — the latter two being purely secular). Following the political divisions of the country, he urges that every canton shall have a primary school, every district a secondary school, and every department higher technical schools; and that there shall be a central institute (a university) at Paris. Primary instruction is to be free to all, and the same for boys and girls. The secondary schools are to be subsidized by the state, which will especially see that clever poor students may reach them; but the pupils generally must contribute. So with the technical schools (theology, law, medicine, and military) and the institute, in which the state was to have the finest laboratories and the best professors obtainable. Finally he makes suggestions for the education or intellectual stimulation of the adults in the community, chiefly by spectacles, festivals, and libraries. The scheme was adopted, and was carried into law (on paper) by Danton in 1795, but the revolutionary troubles prevented its realization. Napoleon actually founded the institute, and began to realize some modification of Talleyrand's general scheme. But Talleyrand's democratic ardor had gone, and we do not find him conspicuously associated with the Emperor in education. J. McC.

See Napoleon and Education.

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TALMUD AND TALMUDIC SCHOOLS. — See Jewish Education.

TAPPAN, ELI TODD (1824–1888). — College president and author of mathematical textbooks; educated at St. Mary's College, Baltimore. He was superintendent of schools at Steubenville, O. (1856–1859); professor in the University of Ohio (1859–1868); president of Kenyon College (1868–1875); professor in Kenyon College (1875–1887); and state superintendent of schools of Ohio (1887–1888). His publications include *Plane and Solid Geometry* (1867), *Geometry and Trigonometry* (1868), and *Elements of Geometry* (1885).
W. S. M.

TAPPAN, HENRY PHILIP (1805–1881). — University president; graduated from Union College in 1835 and from the Auburn Theological Seminary in 1827. He was professor of moral and intellectual philosophy in New York University and president of the University of Michigan (1852–1863). He was one of the founders of the American Association for the Advancement of Education (*q.v.*) and one of its early presidents. His publications include *Doctrine of the Will* (1841), *Elements of Logic* (1844), and *University Education* (1851). W. S. M.

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TARBELL, HORACE SUMNER (1838–1904.) — School superintendent; graduated from Wesleyan University in 1859. He was superintendent of schools at East Saginaw, Mich. (1870–1876); state superintendent of public instruction in Michigan (1877–1878); superintendent of the schools of Indianapolis (1878–1884); and superintendent of the schools of Providence (1884–1902). He was the author of schoolbooks on grammar, geography, and language. He was a member of the Committee of Fifteen (*q.v.*), and wrote the report on the training of teachers. W. S. M.

TARDINESS. — See Attendance; School Management.

TARKIO COLLEGE, TARKIO, MO. — A coeducational institution founded in 1883 by local enterprise. It was chartered as Tarkio College in 1885 by the United Presbyterian church. It has a campus of twenty acres with five buildings, valued at $115,000. Its endowment amounts to $200,000. It has preparatory, commercial, music, and art, as well as collegiate, departments. Sixteen units are required for admission. In 1910–1911 it had a teaching staff of twenty-seven and an enrollment of 303 students. J. A. T.

TARTAGLIA, NICOLÓ. — One of the most prominent mathematicians of Italy in the sixteenth century. He was born at Brescia about 1506 and died at Venice in 1559. He was the first to give a general solution of the cubic equation. His works include the *Nova Scientia*, chiefly algebraic; editions of Euclid, Archimedes, and Jordanus; the *Quesiti et inventioni* and *Regola generale*, chiefly physical; and the *General Trattato* in six volumes, published during the period 1556–1560. D. E. S.

TASKS AND PUNISHMENTS. — See Rewards and Punishments.

TASMANIA, EDUCATION IN. — See Australia, Education in.

TASTE SENSATIONS. — The chief organ of taste is the tongue, although taste organs are found on the soft palate, the epiglottis, and the cords of the larynx. The number of taste qualities is four: sweet, salt, sour, and bitter. The other qualities that are ordinarily called tastes are compounds of taste with smell or with cutaneous qualities. The nerve ends of taste are the taste buds, structures which consist of modified sense epithelium among supporting cells. The taste buds are arranged on the sides of papillæ, small elevations that are distributed over the tongue. Several different qualities may be appreciated by a single papilla, although in general the tip of the tongue senses sweet, the sides sour, and the back bitter, while salt is fairly evenly distributed. The substances to be tasted come to the papillæ in solution and are brought into contact with the sense organ. The stimulation is through a chemical reaction induced in the organ by the substance in solution. W. B. P.

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TATTOOING. — See Primitive Peoples, Education among.

TAUNTON COMMISSION. — See Parliamentary Education Commissions; England, Education in.

TAUNTON, LORD. — See Parliamentary Education Commissions.

TAXATION FOR EDUCATION. — See Apportionment of Funds; Free Schools; School Funds; also National Government and Education; and the section on School Support in the articles on Education in the various countries and the states of the American Union.

TAXIS. — See Tropism.

TAYLOR, JEREMY (1613–1667). — The great Anglican divine; for some time after the battle of Naseby, a schoolmaster in South Wales at Newton Hall, Llanfihangel-Aberbythych, Carmarthenshire. He was a pupil at Perse Grammar School, Cambridge, a fellow of Caius College, Cambridge, and also a fellow of All Souls', Oxford. There is a tradition that Jeremy Taylor kept school in any cottage or building he could hire for the purpose. He was assisted by William Wyatt, and the two produced a school textbook entitled: *A new and easie Institution of Grammar. In which the labour of many years spent in learning the Latin tongue, is shortened and made easie. In usum Juventutis Cambro-Britannicæ* (1647). Taylor was afterwards assisted in the school by William Nicholson, who had been head master of Archbishop Whitgift's (*q.v.*) school at Croydon, and who on the Restoration became Bishop of Gloucester. Jeremy Taylor also wrote *A Short Catechism composed for the use of the Schools in South Wales.* Dean Rust said of Taylor, "He had devotion enough for a cloister, learning enough for a university, and wit enough for a college of *virtuosi*; and had his parts been parceled out amongst his clergy, it would perhaps have made one of the best dioceses in the world." F. W.

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TAYLOR, SAMUEL HENRY (1807–1871). — Principal of Phillips Academy at Andover (*q.v.*) and educational writer; graduated from Dartmouth College in 1832. He was for two years instructor at Dartmouth; for three years instructor at Phillips Academy, and principal of the academy from 1837 to his death. His publications include *Methods of Classical Study* (1861), *Classical Study* (1870), and a series of Greek grammars. W. S. M.

TAYLOR UNIVERSITY, UPLAND, IND. — The outgrowth of Fort Wayne College, organized in 1846. In 1890 the institution was reorganized, renamed, and removed to Upland. It is under the control of the National Association of Local Preachers of the Methodist Episcopal Church. In addition to the college courses, academic, theological, musical, oratorical, and business courses are given. The entrance requirements are four years of academy or high school work. The college plant consists of seven buildings. The student enrollment is about 270, including academic students, and the faculty membership twenty-two. M. V.

TEACHER. — Those who give instruction receive particular designations according to the various special functions to which they are assigned. (1) *Assistant teacher.* (*a*) A grade teacher or associate teacher in the sense that he assists the principal teacher or principal (see USHER); (*b*) one who, unassigned to a particular classroom, assists the regular teachers in giving special individual instruction to backward individuals wherever needed; or (*c*) a teacher in charge of an ungraded classroom specially provided for individual instruction. (2) *Apprentice or student teacher.* One who is a student of the teaching process, a beginner in the art of teaching, usually called (*a*) an *apprentice teacher* when he begins his practice as an assistant in the school system under the supervision of a regularly licensed teacher, or (*b*) a *student teacher* when he acquires his first practical knowledge of and skill in teaching in the special laboratory or practice school of a normal school or teachers' college. (3) *Class teacher.* (*a*) *A grade teacher,* one who is assigned to the responsible management and instruction of a single class or grade. The term is more frequently used to distinguish (*b*) the teacher in general charge of the management and discipline of a class in the high or grammar school under the departmental system, one teacher instructing many grades or classes in a single subject. (4) *Critic teacher.* In the training school, one who is a class teacher and at the same time responsible for the supervision of student-teachers engaged in practice teaching in his class. (5) *Departmental teacher.* When instructors teach one subject in many grades instead of all subjects in one grade, they are known as departmental teachers. (6) *Special teachers.* In the elementary school the normal practice is for one teacher to teach all the subjects in a given class. When, however, the regular class teachers are relieved of instruction in such special subjects as music, drawing, manual training, etc., this function is performed in several grades by a special teacher. (7) *Receiving teacher.* The teacher of the first primary or receiving class. (8) *Substitute teacher.* (*a*) A regularly employed teacher (sometimes the least experienced and sometimes the best equipped) whose business it is to go from school to school filling the temporary vacancies caused by absentees. (*b*) Sometimes a teacher not regularly employed, and perhaps not duly licensed, who is engaged to teach a class during a short period of vacancy. (9) *Supervising teacher.* A special teacher, working throughout a school system, who spends part of his time teaching his special subject and the remainder directing and supervising the same. (10) *Supervisory teacher.* The teacher, usually in charge of the highest grade in a small school, who is designated to perform the duties of principal while teaching his own class. H. S.

See MASTER; SCHOOL; UNIVERSITIES; USHER.

TEACHERS' AGENCIES. — See AGENCIES, TEACHERS EMPLOYMENT.

TEACHERS AND PROFESSORS, INTERNATIONAL EXCHANGE OF. — See UNIVERSITY TEACHERS AND STUDENTS, INTERNATIONAL EXCHANGE OF.

TEACHERS' AND SUPERVISORS' SALARIES. — See TEACHERS, SALARIES OF.

TEACHERS, APPOINTMENT OF. — **United States.** — In no respect is the democratic character of American public education more conspicuous than in the matter of the appointment and dismissal of teachers. During the colonial and post-revolutionary period, practically all of the factors determining the official status of the teacher — license, appointment, compensation, promotion, and tenure — were under the control of the community electorate, either directly or indirectly, through duly constituted representatives. In New England the clergy possessed the bulk of the representative influence throughout both periods.

The centralizing tendencies in all departments of school control during the second half of the nineteenth century, resulting in (*a*) the wide extension of the power of the state, and a consequent diminution of the authority of the local community; and (*b*) the increase in the control exercised immediately by local school authorities as contrasted with that exercised directly by the body of citizens, have been far less operative in those matters affecting the legal and economic position of the teacher. The principal exception to be noted is in the systems of training and licensing teachers. These the states have assumed more and more directly to oversee and to regulate. With the establishment of minimum salary scales and of retirement funds there is to be observed the opening of another avenue of important influence by the state. In the matter of the appointment, promotion, and tenure of teachers for its schools the local administrative unit, — district, township, city, county, — acting through its organized representatives, is still, to the largest degree, autonomous. This circumstance has been responsible for the now disappearing practice of utilizing the positions in the public school service as means for the furthering of personal or party ends.

The typical and prevailing American method of the appointment and dismissal of teachers of public elementary and secondary schools is through local lay authorities, — boards of education, boards of school directors, school committees, etc. The smaller and less urban the community, the more direct is the determining influence of these boards. This influence tends to become lessened in the more urban communities and in those in which there are highly developed standards of educational accomplishment. In the smaller community the relation of the governing authority to the teacher is very similar to that obtaining between private employer and employee. In the more highly organized school system this relationship is more largely determined by the legal conventions of public service.

The great majority of teachers in non-urban public schools of the Northern and Western states are appointed directly by local school boards. In those states where the system of county supervision prevails, county superintendents frequently come to possess large advisory unofficial influence. Under certain systems of township school government, like that of Indiana, a single school trustee exercises exclusive jurisdiction over the appointment and dismissal of teachers. Under the county system found in a number of Southern states, county superintendents of schools determine the appointment of teachers for all the schools of the county.

Three principal methods for the selection and appointment of teachers are employed in American cities.

(*a*) The *direct* method: appointment by board of education, with or without nomination by a committee of its own members.

(*b*) The *direct-indirect* method: appointment by board of education, upon nomination by the chief professional officer (superintendent of schools). This nominating authority is exercised by voluntary grant of the board.

(*c*) The *indirect* method: appointment by board of education upon the nomination of the chief supervisory authority (superintendent of schools, board of superintendents, etc.). This nomination is a legal essential, without which appointments may not be made.

In the greater number of American cities teachers are appointed by the direct method. In a considerable number of cities appointments are made according to the direct-indirect method. The tendency of evolution, as the profession of school supervision becomes more specialized and more highly developed, is from the direct to the direct-indirect method, and to the indirect method.

The indirect method now used in a small number of cities represents the result of a movement for the establishment of a strict civil service régime for the appointment of teachers. For this purpose there is usually constituted a board of examiners for passing upon the academic, professional, and personal qualification of persons seeking to become eligible for appointment. The examinations conducted by this board result in the creation of eligible lists from which appointments are made. The system in operation in the city of New York illustrates the fullest development of this method. By charter provision the board of examiners holds examinations as to the academic, professional, and personal qualifications of candidates for licenses for the various grades of positions. On the basis of these examinations appropriate eligible lists are prepared. Appointments are made by the board of education, upon the nomination of the board of superintendents. In making nominations for appointment, the board of superintendents may consider, for each appointment, the three persons whose names stand highest on the eligible list. The failure on the part of the board of education to confirm or to reject a nomination within forty days is held as equivalent to the appointment of the nominee.

The instructional staff in state higher and professional schools is uniformly subject to direct appointment by the board of control (board of regents, state board of education, board of control, etc.). In the case of those institutions which are not subject to the disturbing influence of boards organized with partisan standards or political motives, teaching appointments are made only upon the nomination of the president or director of the institution. In those higher institutions, possessing traditional democratic standards of academic organization, the nomination of the head of the institution is in reality a recommendation of the particular department of instruction concerned. There is, at the present time, in certain of the more important state universities, a well-defined opposition to the exclusive jurisdiction of lay governing boards or of presidents and directors in the selection and appointment of the staff of professors and instructors. Along with this opposition is a distinct tendency toward the formulation of schemes of control that will result in placing within the faculty the ultimate determination of its own membership.

American courts have uniformly held appointments, as teachers in common schools, of those not possessing legal qualifications and license to be illegal. It has also been generally held that no compensation may be paid or collected for service rendered by any such unqualified or unlicensed appointee. (See CERTIFICATION OF TEACHERS.)

By general legislative action nepotism on the part of local boards of school control is prohibited. This prohibition has been found particularly necessary in the case of school authorities of rural administrative areas.

American teachers are usually appointed for a period of one year, at the end of which reappointment by the appointing authority is necessary. Such a system results in brevity of tenure and lack of permanency of service. Each year from one third to one half of the teachers in public elementary and secondary schools either leave the service or transfer to schools of other communities. This situation constitutes one of the grave problems of American education. Modification for the better will be possible only by the removal of those influences detrimental to the selection and permanent appointment of the fittest teachers and by the proper compensation of these teachers. (See TEACHERS, TENURE OF.)

The marked tendency of the present time, especially in the more progressive communities, is to make the initial appointment probationary for one year. The rendering of successful service during this probationary year results in a permanent appointment, dismissal from which can be made only after the substantiation of charges of gross misconduct, insubordination, neglect of duty, or general incompetence. In New York City the initial license to teach is issued for one year and may be renewed without examination in case the work of the holder is satisfactory to the city superintendent for two successive years. At the close of the third year of continuous successful service, the city superintendent may make the license permanent. This in practice means permanency of tenure after the period of probationary service.

England. — Under the education act of 1902 and subsequent acts the appointment of elementary school teachers in England is in the hands of the local government authority (councils). This power may be delegated to the education committee, or to the managers of schools. In every case, for provided as well as non-provided schools, an appointment must be sanctioned and confirmed by the local authority. A regular system of advertising vacancies is followed. On the basis of testimonials submitted, unsuitable applicants are eliminated. Usually the best three applicants then appear before the nominating committee for choice. All teachers in elementary schools are appointed under stamped written agreements. The appointment and service of teachers without such written agreements may result in the refusal of the board of education to recognize such teachers as a part of the staff and the jeopardizing of the grant to the school. The education acts and the regulations of the board of education define the conditions of eligibility for appointment to the staff of a school or department. These conditions are variable owing to the absence of a well-established plan for the training of teachers. The tenure of appointment is fairly secure. The appointment of secondary school teachers, in the past a private matter between managers and teachers or between master and assistants, is being organized on a public service basis as a system of public secondary education is gradually being developed under the control of the board of education.

France. — The high degree of central organization and the extent of direct state control of education in France give to the educational service a distinctively public character. The appointment, promotion, and transfer of the members of the faculties of the universities and of the normal schools, and the directors and all regular fully certificated teachers in the higher primary and secondary schools, are under the direct power of the Minister. The power of appointing the lower of the two classes (probationers) of teachers in the elementary primary schools — *stagiaires* — belongs to the academy inspector with which educational officer thereby rests the united authority for passing upon the eligibility of all persons entering the permanent teaching staff. The *titulaires*, or regular teachers, are appointed by the prefect, the chief civil administrative officer of each department, but only on the recommendation of the academy inspector. The same conditions govern the transfer of *titulaires*. The tenure of office under the French scheme is permanent, with definite salary promotion based in part on service and in part on merit.

Germany. — The standards and conditions for appointment and service of teachers in public schools throughout Germany are very similar, notwithstanding the autonomous control over education exercised by the several states. The general essential prerequisites for appointment as a teacher in either elementary or secondary schools are a definite period of training and a definite period of approved probation service.

In Prussia the appointing authority for teaching positions in the universities rests primarily with the Minister; in secondary and normal schools with the school board (Provinzialschulkollegium) of each of the thirteen provinces; in elementary and middle schools with the royal county departments for ecclesiastical and school affairs (thirty-six in number). This latter authority also ratifies those appointments that may be made by patrons and local school committees.

The first appointment of a teacher is temporary. Permanent appointment takes place only after the second examination — for elementary teachers, before the provincial school board, and for secondary school teachers before an examination commission. Permanent appointments are not confirmed until candidates have passed through the period of military service. E. C. E.

See also articles on England, France, and Germany, Education in. Also articles on Teachers, Promotion of; Teachers, Salaries of; and Teachers, Appointment of.

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TEACHERS, APPRENTICE. — See Teacher; Teachers, Training of.

TEACHERS' ASSOCIATIONS. — See Associations, Educational; Teachers' Voluntary Associations.

TEACHERS COLLEGE, NEW YORK CITY. — The professional training school for teachers connected with Columbia University (*q.v.*). The germinal institution was the Industrial Education Association, formed in 1884, to give instruction in elementary home economics and manual arts to those children who were getting no such guidance either in school or at home. In the membership of the association were President Barnard of Columbia, Mr. Seth Low, then mayor of Brooklyn, and Miss Grace Dodge, the latter being then and to the present time a most active supporter of the institution. The association soon found that the most effective way of promoting instruction in the manual arts in the public schools would be by providing adequately trained teachers.

Reformers and leaders interested in other aspects of education had reached a similar conclusion. As early as 1858, and repeatedly afterwards, President Barnard had proposed to the trustees of Columbia College that "the science and art of education" be included in the curriculum. In 1886 he and his advisers were considering means of establishing "a teachers' college on a university basis." These two lines of endeavor coalesced in 1887, and the New York College for the Training of Teachers was incorporated. Later, the title was changed to Teachers College. Professor Nicholas Murray Butler, of the Columbia College faculty, was made president. In 1891 President Butler withdrew from the administration of the college, and was succeeded by Dr. Walter L. Harvey, who remained in office until 1897. Meanwhile it had been found that few of the students presenting themselves for professional training were adequately prepared; hence in 1893 an introductory college year was added to the two professional years. In 1894 a fourth year was provided, and thus a full collegiate course, half academic, half professional, was organized. A school of observation had been established early. The growth of this school soon made its quarters in University Place inadequate. In 1894 the college moved to the present site, adjoining the plot which three years later was to become the seat of the university.

From the first there was a continuous advance in the character of the work done, professional and technical; in the demands made on the institution; and in the numbers and equipment of the student body. During President Butler's administration (1890) an alliance had been entered into between Columbia University and Teachers College. When Columbia University came to its new site, a closer alliance was effected, though the college continues to have a separate board of trustees. Under this arrangement, President Low became *ex-officio* president of Teachers College and Professor James E. Russell was elected dean.

By 1911–1912 the two lines of work which the college had fostered from the first had become so fully developed, the student body so large, and the demands upon the college so diverse, that the professional and the technical work were divided, and a school of education and a school of practical arts were established, each under its own faculty. The professional aspect of the college work has developed apace since 1897. The enrollment of matriculated students has increased from 169 in 1897-1898 to 1623 in the year 1911-1912, with 408 additional in the summer session. In addition there were more than 400 registrations in the college from other faculties of the university. Graduate students have increased from 30 in 1897 to 421 in 1911-1912. Of this number 66 were candidates for the Ph.D. These graduates represent 158 different colleges and universities. The distribution of the appointments made from the graduates each year is a further indication of the development. These have increased from 127 in 1900 to 672 in 1911-1912. Of these appointments, 110 were to colleges and universities. More than 12,000 persons, most of whom are in the teaching profession of this country, have received a year or more of professional training in the college. Of these about 4000 have received degrees or diplomas. With the differentiation of the professional work and the technical work, it is quite evident that the future work of the college in each of these fields will lie more in the field of advanced training and research than in the undergraduate professional courses as hitherto, and it is proposed within a few years to make the school of education a graduate school only. The professional work of the college is given in detail in the article on Education, Academic Study of.

TEACHERS' CONFERENCES. — See Teachers, Training of, under *Improvement of Teachers in Service.*

TEACHERS, EXAMINATIONS FOR. — See Certification of Teachers; Examiners, Boards of; and Training of Teachers.

TEACHERS' GUILD, ENGLAND. — See Teachers' Voluntary Associations.

TEACHERS, IMPROVEMENT OF THOSE IN SERVICE. — See Teachers, Training of.

TEACHERS' INSTITUTES. — See Institutes, Teachers'.

TEACHERS' LIBRARIES. — See Libraries, School; Museums, Educational; Reading Circles.

TEACHERS' MAGAZINES. — See Journals, Educational.

TEACHERS' MEETINGS. — See Teachers, Training of, under *Improvement of Teachers in Service.*

TEACHERS, PROMOTION OF. — United States. — The social and economic conditions influencing the teacher in the United States favor an abbreviated term of professional service. The available, though incomplete, data point to the conclusion that, by and large, the term of service of the great majority of teachers in the public schools is less than five years. Obviously this is in sharp contrast to the situation in the chief European states, where conditions have developed a professional permanency. The decentralization of control of the principal factors determining the status of the American teachers results in a high degree of mobility of the teaching population. Excluding the larger cities of the country, from one third to one half of public school teachers shift each year from the schools of one community to the schools of another. This brevity of tenure and this constant movement from school to school tends to retard the development of any organized system of promotion within the teaching service. (See Teachers, Appointment of.)

The term "promotion," as applied in American schools, has numerous meanings. The following principal usages may be distinguished: —

Promotion by transfer; i.e. passing from small schools to large schools, or from rural schools to urban schools. The rapid drift of population to urban centers has produced an unprecedented growth of the public school system of cities and a consequent demand for teachers that far exceeds the normal supply. The general practice of city schools of restricting appointment to teachers of experience means that the greater proportion of the teachers in city elementary schools have had their first experience in village and rural schools. While, generally speaking, the better salary standards of the city operate as the chief attractive and selective influences for the members of the teaching staff of city schools, the conditions of life and the comparative isolation are forces constantly acting for the promotion to the city of the more competent moiety of the teachers of country schools.

Promotion by class advancement; i.e. advancement from any school or class to one of a higher order; as, for example, from the lower to the upper grades of elementary schools; from elementary to secondary schools; from secondary to higher schools. While in many communities certain educational traditions place the teaching positions in the upper grades of elementary schools above those of the lower grades, the easily observed tendency of development is to regard all teaching positions in an elementary school as of equal rank. The most numerous exceptions are to be found in the case of teachers of the lowest class (first grade) and the highest class (eighth grade) in elementary schools. Secondary school positions are, by reason of the higher standards for qualification and better salaries, regarded as above elementary school positions. This form of promotion is not widely prevalent. The separation between elementary and secondary school teachers in the United States rests on an economic and professional basis rather than upon a social class feeling as is the case in continental school systems. Teaching positions in college and university are everywhere regarded, on account of ancient academic distinctions, supplemented by the higher and more intensive modern scholarship requirements, as above those in secondary schools. The growing practice of American higher educational institutions is to draw the members of the lower instructional staff from the ranks of successful secondary school teachers. The relatively higher salaries paid in the better secondary schools, public and private, as compared with those of the lower positions in college or university, have produced an obstacle to this form of promotion.

Promotion by license; i.e. the acquirement of a certificate or license of higher grade, thereby fulfilling the essential condition of eligibility for higher positions. This is merely a form of indirect promotion rather than a promotion proper. The cumulative, graded character of many of the state systems of certification of teachers affords a certain stimulus for this form of professional advancement. (See CERTIFICATION OF TEACHERS.)

Promotion for supervision; i.e. advancement from classroom teaching to positions of educational direction (principalships, superintendencies). Practically all of the professional administrative and supervisory posts in the public schools are filled by this form of promotion. The absence of any recognized or well-defined standards for those assuming the professional direction of schools has developed a rough-and-ready method of selection from the ranks of those of presumedly successful teaching experience.

Promotion by salary. This is by far the most highly organized form of promotion. It has found its best development in the school systems of cities as a means for the establishment of permanency and of professional betterment of the teaching corps; likewise in those states in which minimum salary scales prevail, as, for instance, in Indiana.

While in the main each of the above forms of promotion is dependent upon a complex of indefinite and unorganized factors of community circumstance and of individual personality, training, and ability, the following methods of promotion may be noted: —

Fortuitous. — Under a system of popular lay control of schools such as that found in the United States, the promotion, as well as the appointment, of teachers is largely conditioned by elements of favoritism, partisanship, or mere chance rather than by those of personal merit or professional efficiency. This method, for the most part, characterizes each of the enumerated forms of promotion. The obvious effect of this method is to place the competent and the incompetent on an approximate level for promotion.

Automatic. — This method is most commonly employed in connection with salary promotion and is usually based on service alone, although nominally such service must be satisfactory or successful. Salary schedules such as are now found in cities and higher institutions, providing for annual or other periodical increments of the compensation of teachers, represent the typical application of this method. (See TEACHERS, SALARIES OF.)

Merit. — By this method regular or extraordinary advancement in rank or compensation is based upon special inspections and ratings of teaching accomplishment or upon the presentation, through formal examination or otherwise, of evidence of further professional study and acquirement. Frequently inspection of work and further study are combined to form a basis for promotion on merit. In recent years systems for advancement in accordance with measures of ability and accomplishment have been put into operation in a number of cities — New York, Chicago, Boston, St. Louis, Baltimore, Kansas City, Denver. In the extensive and highly organized school system of the modern metropolitan community the utilization of the method of merit, alone or in combination with the automatic-service method, has been necessary both for the protection of the great body of teachers from self-interested, social, and partisan influences and for the supplying of objective motives for the stability and efficiency of the teaching staff. In this connection record should be made of the system of salary advancement provided for the teachers of the secondary schools of New York City under the so-called equal salary law of 1911. Twelve annual increments of salary are provided, the minimum (first year) salary being $900 and the maximum (thirteenth year) salary being $2650. No teacher may advance beyond the salary of the third year, except those with approved experience, until a permanent license has been obtained. This means the rendering of satisfactory service for three successive years. No teacher may advance beyond the salary of the sixth year until his service has been approved as fit and meritorious by the board of superintendents. No teacher may advance beyond the salary of the ninth year, nor the salary of the twelfth year, until he is declared by a special committee to be a teacher of superior merit.

Europe. — In each of the principal European states the extent to which the status of the public school teacher — training, certification, appointment, salary, promotion, and pension — is standardized is directly proportional to the degree of direct central control of education. In France and Germany are to be found the most carefully devised and thoroughly developed schemes for the promotion of teachers. General state education in England and Wales is of too recent development to have yielded any systematic and progressive organization of the teaching staff.

All of the forms of promotion of teachers above indicated for the United States are to be found in both France and Germany. Promotion by transfer is widely used for the progressive selection of the more competent teachers, both elementary and secondary. The first appointment of elementary school teachers in Prussia is in all cases held in ungraded rural schools Here, the two to five years' period of probationary service is passed. In France the newly appointed elementary teacher would, under normal conditions, be named as an assistant in a country school, then assistant in a town or city school, later head teacher in the country, and finally director of a town school. This general plan of transfer promotion obtains in the instructional force of both French and German secondary schools.

Inasmuch as the typical European school systems are established in accordance with a plan whereby elementary education is organized into a unit separate and distinct from secondary education, the promotion of teachers from the lower to the higher schools is far less frequent than in the United States. Entirely apart from traditional social barriers between the elementary schools of the people and the secondary schools of the classes, such promotion, by reason of the radically different standards of academic and professional qualification for teachers, is very difficult of attainment. For in each type of school, organized schemes for the promotion of teachers in accordance with the grade of class taught are in general operation. Promotion to supervisory positions (inspectors, directors, etc.) are quite uniformly dependent upon the personal, discriminatory selection by superior officials. In Prussia promotional examinations are held for appointment as principals of elementary schools.

Promotion for the vast majority of teachers signifies promotion by salary. To this end more or less elaborate provisions are to be found, especially in France and Germany. The periodic increases of salary operate in part automatically by service and in part by merit. (See Teachers, Salaries of.)

E. C. E.

See articles on the various national systems; also Certification of Teachers; Teachers, Appointment of; Teachers, Salaries of; Teachers, Training of.

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See also Bibliography on Teachers, Appointment of; Teachers, Salaries of.

TEACHERS' PROTECTIVE UNION. — See Teachers, Voluntary Association of.

TEACHERS' READING CIRCLES. — See Reading Circle; Teachers, Training of, under *Teachers in Service*.

TEACHERS, REGISTRATION OF. — **United States.** — In practically all of the American states, outside of New England, laws require all teachers to register their teaching credentials — teachers' certificates, life diplomas, normal-school diplomas, university documents, etc. — each year with the county superintendent of schools, county board of education, or county board of examination, as a prerequisite to teaching in the county and drawing pay for their services from the school funds. This is a necessary precaution to insure proper certification and also serves to compile the annual county list of teachers. A small fee, usually about two dollars, is often required for each registration, and this usually goes into a fund for the payment of the expenses of the county teachers' institute.

Recently a few states (Massachusetts and New Jersey are examples) have attempted to establish a teachers' registration bureau, to render a service to the schools somewhat analogous to that rendered by the commercial teachers' agencies. A registration fee is usually charged, the credentials concerning each teacher registered are gathered, and an attempt is made to recommend such teachers as are registered to inquiring school authorities for appointment. These registration bureaus are under the control of the state board of education, or the state school commissioner or superintendent. So far, however, but little success has attended these state efforts.

A much more successful form of registration of teachers is that maintained by the larger colleges and normal schools of the United States, but almost entirely for their own students and graduates, the purpose being to bring school authorities of the state and properly prepared candidates together, and to place before school authorities dependable information as to prospective teachers. A so-called Appointment Secretary handles all such requests coming from the schools, confers with and advises students as to how and where to apply, and keeps a record of the work and success of the different graduates. In doing so the different institutions are rendering an important service to the schools, as well as assisting many teachers to positions which they are capable of filling. E. P. C.

England. — In all of the larger recognized professions in England, and most of the smaller ones, there is a permanent roll of members qualified to act, maintained either by some central council or board belonging to the profession in question, or by the government itself. Thus in the army or the navy no one is entitled to call himself officer or private or to act as such unless he has duly *enlisted* or otherwise engaged himself with the government; in the medical profession no person is allowed to practice as a doctor unless he has qualified himself for so doing, and has given evidence of such qualification as to satisfy the general Medical Council. Similarly in the case of the smaller professions, though any one may profess a knowledge of figures, the attestation of any person as to the correctness of accounts would be held of little value in comparison with that of one who held the authorization of the Institute of Chartered Accountants that he was on the qualified roll of that association. In the teaching profession, however, upon which all the other professions in a sense may be said to depend, or at least whose ministrations are required by them at some period or other, there is at the present time no list of any kind of the teaching profession as a whole kept by any authoritative body, and it is open to any one to teach who desires to do so; and though evidence is usually required as to general attainments and knowledge, yet no formal testimony as to capacity is needed, or indeed even often asked for.

On the continent there is an entirely different state of affairs. In France no teacher, whether public or private, can teach without a *brevet de capacité* from the government, and a similar document is required in Germany. Almost every other state of Europe keeps a recognized list of teachers and requires a certain proof of fitness from each member. That there should be this lack of professional registers of competent teachers is not, however, due to the failure of recognition of its importance on the part of many teachers, but rather to the indifference of the public as a whole, and hence by the government of the time, to the claims of education, and also a want of homogeneity among the members. But it would at last seem that a healthy opinion and power of action among educationalists has sprung up, and the country is now on the eve of obtaining that registration, the want of which for so long has almost amounted to a scandal.

It is interesting and important to trace the history of the movement in the direction of registration as throwing light upon the position of education generally, and the problems in the way of the complete solution of the registration question. In 1861 a few private persons interested in education founded a scholastic registration association for the purpose of securing the creation of such a register as has been indicated. The cause was warmly taken up by the College of Preceptors, but was favorably regarded by only a small section of the public. In 1869 when Mr. Forster (*q.v.*) introduced his Endowed Schools bill (*q.v.*), he brought in also a second bill for the better organization of secondary education, and the registration of teachers. This bill was strongly opposed and fell through, but is of much importance as it was the first to outline a qualifying examination for teachers, a record of private schools, and an educational council. In 1879 Sir Lyon Playfair's bill, the principles of which were incorporated in 1881 in Sir John Lubbock's bill, both dealing with the same subject, was brought forward. Both were unsuccessful. The year 1890 saw two bills, the Acland bill and the Temple bill, reach the committee stage; in the former, beside registration, training was required from teachers. The principle of registration for all teachers now began to find favor with the section of the profession engaged in secondary work, and its advocacy formed one of the main objects of at least one large association. In 1894 a Royal Commission on secondary education was held, under the presidency of Mr. Bryce, and its *Report* stated that while it was unable to give a complete solution for the problems before it "upon no subject of all those on which we have received evidence was there more general agreement than as to the necessity of some measure for the registration of teachers."

As a result of this *Report* the Duke of Devonshire's bill was brought in in 1898, and resulted in the act of 1899, by which an educational council and a register of teachers were established. The roll thus formed was divided into two columns named *A* and *B*. In column *A* were included *en bloc* all the teachers in elementary schools. In column *B* were placed the teachers in secondary schools, who, in order to gain admission, had to fulfill certain conditions as to general attainments, and show either training or previous experience at a recognized school. A number of teachers were at pains to seek admission to column *B*, but a good many stood out, and it was found after several years that there was grave dissatisfaction as to this registration and its results. This feeling found expression in the ranks of the elementary teachers, to whom the distinction involved in the existence of the two columns was a grave grievance.

Moreover, it was ascertained that the regulations for inclusion in column *B* did not encourage the training of secondary teachers in the way it was supposed it would do.

Accordingly in 1907, under the Educational Administration Provision act, the obligation to keep up the registration was abolished, and consequently the council and register came to an end. But at the same time as the register was abolished an amendment was added, authorizing the establishment at some future time by Order in Council of an alphabetical register of teachers in one column. Considerable annoyance was felt in the educational world at the lack of a register of any sort, and various educational associations held conferences upon the subject and made representations to the board of education. The most important of these was held at the Clothworkers' Hall in November, 1909, where thirty-seven education associations were represented, including the Association of Headmasters and Headmistresses, the Headmasters' Conference, the National Union of Teachers, and many technical associations, with the representatives from the board of education as visitors. Great unanimity was shown in the conclusions arrived at, which dealt with the constitution of the council and the formation of the register advising the single column, sanctioned by the act of 1907. The board of education, realizing that there was now considerable agreement on the subject throughout the profession, held several conferences with various educational bodies to elucidate more fully the various points raised, and it was proved that as far as formation of the register was concerned there were as many difficulties to be solved as heretofore, in respect to minimum attainments, and to the question of subregisters so as adequately to classify or include teachers of technical subjects. However, the board seemed to see, during the progress of these later conferences, that the question which was foremost in the minds of teachers was that of the formation of an educational council, and that the question of the register had fallen into the background. Thereupon a recommendation for an Order in Council as permitted by the act of 1907, for the formation of a Teachers' Council on the lines of that recommended at the Clothworkers' Hall Conference, has been made, with the addition of an important element taken from the universities.

An Order in Council was issued on Feb. 29, 1912, establishing a Registration Council independent of the board of education. It consists of forty-five members, including a chairman, engaged or recently engaged in teaching, and including women. The members are appointed by associations representing teachers and head teachers in elementary schools; headmasters and headmistresses, assistant masters and mistresses, in secondary schools; teachers of technical and special subjects; teachers in special types of schools and in the universities of England and Wales. The chairman is appointed by the council outside its members. The members hold office for three years. The duty of the Registration Council is to form and keep a register of such teachers as satisfy the conditions of the register established by the council. The council appoints ten committees representing the different departments of the teaching profession. The council entered upon office in July, 1912.

H. O.

See AGENCIES, TEACHERS' EMPLOYMENT; UNIVERSITY APPOINTMENT BOARDS; also the articles on the national systems, *e.g.* GERMANY, EDUCATION IN; FRANCE, EDUCATION IN, etc.

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TEACHERS, SALARIES OF. — United States. — *General.* — As long as the church exercised a potent control over the aims and institutions of education in the western world, and as long as the family possessed the major responsibility for the schooling of children, teaching in the higher schools was regarded chiefly as an idealistic and vicarious activity. Neither from a private nor from a public standpoint was the teacher looked upon as engaging in an enterprise of economic moment.

It was not until the function of education was undertaken by the state and the school became a common institution, that the position of the teacher, as an individual and as a class, became an object of public economic concern. As the public school has more and more democratized education, a necessary regimentation of the teaching class has been brought about. The most important feature of this regimentation has been the standardization of both competence and compensation. The state standardization of competence through certificating systems, and the state standardization of compensation through definitive wage standards represent crises in the development of the teaching profession as this profession passed, during the nineteenth century, from a condition determined primarily by social status to a condition regulated directly by legal contract.

Any historical statement of the comparative wages of teachers is very likely, on the one hand, to be inaccurate on account of the lack of reliable data, and, on the other hand, to be misleading by reason of the constant changes in the purchasing power of the units of value. It is certain, however, from numerous sources, that the salaries of colonial teachers were very meager, and that these teachers most frequently were obliged to eke out their slender incomes by the performance of other duties of a religious, or quasi-public nature, or, as it sometimes happened, tasks of the most menial sort. Previous to 1800 the wages of a schoolmaster varied from four to ten dollars per month, besides board, which was generally "given." School mistresses received from fifty cents to a dollar and a half per week, and board. Private tutors received little more than household servants, to which class they were considered as belonging. The amounts paid to teachers in private venture schools or in schools owing their origin to philanthropic or fiduciary undertaking were as low as an established system of private bargaining would place them. Even at the commencement of the modern period of the development of the public school, the economic situation of the teacher had improved but little. Horace Mann in his eleventh annual report as secretary of the state board of education of Massachusetts (1847) presented the following paragraph relative to the compensation of public school teachers in the United States.

> "Look at the average rate of wages paid to teachers in some of the pattern states of the Union. In Maine it is $15.40 per month to males, and $4.80 to females. In New Hampshire, it is $13.50 per month to males, and $5.65 to females. In Vermont it is $12 per month to males, and $4.75 to females. In Connecticut it is $16 per month to males, and $6.50 to females. In New York it is $14.96 per month to males, and $6.69 to females. In Pennsylvania it is $17.02 per month to males, and $10.09 to females. In Ohio it is $15.42 per month to males, and $8.73 to females. In Indiana it is $12 per month to males, and $6 to females. In Michigan it is $12.71 per month to males, and $5.36 to females. Even in Massachusetts it is only $24.71 per month to males, and $8.07 to females. All this is exclusive of board; . . ."

As might be expected under the present diverse conditions of state control, the widest variations obtain in the United States as to the compensation of public school teachers, not only between the different states and cities, but also between the several grades or classes of schools. According to the compilations of the United States Bureau of Educa-

SALARIES OF TEACHERS AND PRINCIPALS IN CITY SCHOOLS — ELEMENTARY AND HIGH. (1904.)

Cities		High Schools								Elementary Schools							
		Principals				Teachers				Principals				Teachers			
Population in Thousands	No. of cities	Number	Highest Individual	Lowest Individual	Average	Number	Highest Individual	Lowest Individual	Average	Number	Highest Individual	Lowest Individual	Average	Number	Highest Individual	Lowest Individual	Average
1,000 and over . .	3	37	$ 5,000	$ 1,900	$ 3,663	1,211	$ 3,500 2,500[1]	$ 800 550[1]	$ 1,615	902	$ 3,500 2,500[1]	$ 995 815[1]	$ 2,282	19,284	$ 3,000 2,500[1]	$ 550 470[1]	$ 906
200–1,000	16	63	4,200	1,260	2,685	1,547	3,060 2,040[1]	444 450[1]	1,230	1,073	3,180 2,400[1]	700 585[1]	1,455	14,344	2,460 1,500[1]	348 315[1]	677
100–200 .	20	42	3,200	990	2,418	1,073	2,300 2,000[1]	450 200[1]	1,044	749	2,100 2,000[1]	585 500[1]	1,087	7,321	1,000 1,010[1]	450 300[1]	603
50–100 .	38	51	3,000	1,200	2,248	876	2,500 1,500[1]	500 360[1]	981	793	2,500 2,000[1]	540 400[1]	1,075	7,695	1,400 1,200[1]	350 250[1]	572
30–50 . .	58	65	3,250	600	1,682	810	2,600 1,250[1]	475 300[1]	850	759	2,000 1,900[1]	320 240[1]	922	6,642	900 900[1]	250 120[1]	517
20–30 . .	74	80	3,500	720	1,691	820	2,800 1,320[1]	450 360[1]	798	666	2,500 2,000[1]	405 325[1]	794	5,001	840 950[1]	315 225[1]	479
15–20 .	60	59	2,300	720	1,464	502	1,700 1,600[1]	450 315[1]	799	421	1,800 1,500[1]	360 352[1]	733	3,077	800 900[1]	360 216[1]	486
10–15 . .	110	103	2,600	560	1,317	701	1,750 1,200[1]	360 270[1]	709	552	1,700 1,200[1]	405 300[1]	680	4,307	1,045 1,000[1]	393 180[1]	456
8–10 . .	87	76	2,400	600	1,174	495	1,400 1,100[1]	500 234[1]	650	315	1,400 1,000[1]	320 405[1]	633	2,630	900 850[1]	195 150[1]	446

[1] Women.

tion for 1909–1910, the average monthly salary of teachers for the United States was $61.70: for men, $68.86; for women, $53.40. It is impossible to base any comprehensive conclusions on these general figures, combining as they do the wide differences existing between school years of different lengths in the several parts of the country, between different classes of schools, and between teaching and supervisory positions. If these average monthly amounts be translated into amounts representing gross average annual incomes, *i.e.* by multiplying the average monthly salary by the length of the school year, the results are somewhat more easily interpreted.

	AVERAGE LENGTH OF SCHOOL SESSION	AVERAGE ANNUAL SALARY	
		Men	*Women*
UNITED STATES . . .	157.5	$542	$420
North Atlantic States .	180.2	724	488
South Atlantic States .	132.0	334	255
South Central States .	125.7	372	306
North Central States .	165.4	601	445
Western States . . .	163.2	724	540

Naturally there is considerable deviation from these amounts for a number of the individual states within these several groups. Nevertheless, these averages closely approximate the median annual salaries computed by Coffman in his careful studies on the social composition of the teaching population (men, $675; women, $485).

City Schools. — The table on page 509 is prepared from the data collected in 1904 by the special committee of the National Education Association (committee on salaries, tenure, and pensions of public school teachers in the United States) relative to the salaries of the teaching force (92,892) of 467 out of the 547 towns and cities having a population of 8000 and over, exhibits the country-wide situation for city school systems.

The upward tendency of salaries of city school teachers is shown by the following tabulation (p. 511) from the special reports of the United States Bureau of Education (1911) regarding representative cities of 10,000 population and over.

Salary Schedules. — Under the necessity of providing a stimulus for permanency of the teaching corps, and as a ready device for promotion, a majority of the urban school systems have established graduated salary schedules. These salary schedules provide for minimum salaries for particular grades of service, together with periodic increments to a maximum. These increments are based generally upon service alone, although the tendency to condition them upon meritorious service is marked. (See TEACHERS, PROMOTION OF.) The important items in the schedules for the leading cities of the United States are given in the articles on those cities.

High Schools. — Thorndike's study in 1908 (see bibliography) showed that the annual salaries of men teachers in public high schools ranged from less than $300 to $3500 ($5000 if principals were included) with a median salary of $900. Of a hundred men, 5 received less than $500, 51 from $500 to $1000, 27 from $1000 to $1500, 10 from $1500 to $2000, and 7 from $2000 up. Fifty-three per cent received from $600 to $1000 inclusive. The salaries of women teachers ranged from less than $200 to $3000, with a median salary of $650. Of a hundred women, 22 received less than $500, 59 from $500 to $1000, 14 from $1000 to $1500 and 5, $1500 or over. The salaries of half of these women teachers were between $400 and $675 inclusive. The inequality in the length of the school year in different parts of the country must be considered in interpreting the variations toward the very low amounts.

Rural Schools. — The following summary, based upon National Education Association data of 1904, presents the salary situation prevailing in the rural schools of a few typical states. The statutes for any state will be found in the special article on that state.

CALIFORNIA. — *Women:* lowest, $360 for 32 weeks; highest, $850 for 40 weeks. *Men:* lowest, $400 for 32 weeks; highest, $1200 for 40 weeks. *Typical* salaries ranged from $520 to $720 for men and from $480 to $675 for women for a school year varying from 32 to 36 weeks.

CONNECTICUT. — *Women:* lowest, $180 for 36 weeks; highest, $972 for 36 weeks. *Men:* lowest, $320 for 40 weeks; highest, $468 for 39 weeks. *Typical* salaries ranged from $285 to $333 for a school year of 36 to 40 weeks.

ILLINOIS. — *Women:* lowest, $150 for 24 weeks; highest, $405 for 36 weeks. *Men:* lowest, $120 for 24 weeks; highest, $540 for 32 weeks. *Typical* salaries ranged from $180 to $240 for a school year of 24 to 32 weeks.

NEW YORK. — *Women:* lowest, $160 for 32 weeks; highest, $600 for 40 weeks. *Men:* lowest, $186 for 32 weeks; highest, $700 for 40 weeks. *Typical* salaries ranged from $360 to $456 for a school year of 36 to 40 weeks.

PENNSYLVANIA. — *Women:* lowest, $140 for 28 weeks; highest, $450 for 36 weeks. *Men:* lowest, $140 for 28 weeks; highest, $630 for 36 weeks. *Typical* salaries ranged from $228 to $287 for a school year of 28 weeks.

SOUTH CAROLINA. — The average yearly salary for white teachers was $203, with an average school year of 22 weeks. For negro schools, the average was $83 for a school year of 14–15 weeks.

VIRGINIA. — With an average school year of less than six months the average monthly salary of women was approximately $22; of men, $25.

The low salary standards for teachers in rural public schools operate as the largest hindrance to the improvement of these schools, not only in the United States, but in nearly all foreign states. Two movements are resulting in some betterment in the American states, (*a*) the lengthening of the school year, — the tendency being toward a standard of eight months — and (*b*) the establishment of minimum salary scales.

Comparison of minimum and maximum salaries of elementary school teachers reported to the Bureau of Education in 1911 with those reported to the committee of the National Education Association in 1905.

CITIES OF 100,000 POPULATION AND OVER

Cities	Minimum and Maximum in 1905.[1]	Minimum and Maximum in 1911	Increase in Minimum Salary	Increase in Maximum Salary
Los Angeles, Cal.	$600.00– $760.00	$744.00–$1,080.00	$144.00	$320.00
Oakland, Cal.	660.00– 900.00	780.00– 1,200.00	120.00	300.00
San Francisco, Cal.	720.00– 996.00	840.00– 1,224.00	120.00	228.00
New Haven, Conn.	300.00– 750.00	450.00– 850.00	150.00	100.00
Chicago, Ill.	550.00– 1,025.00	650.00– 1,125.00	100.00	100.00
Indianapolis, Ind.	400.00– 650.00	850.00	——	200.00
New Orleans, La.	315.00– 540.00	450.00– 700.00	135.00	160.00
Boston, Mass.	552.00– 1,080.00	552.00– 1,080.00	——	——
Detroit, Mich.	350.00– 725.00	500.00– 1,000.00	150.00	275.00
Grand Rapids. Mich.	350.00– 700.00	400.00– 750.00	50.00	50.00
St. Paul, Minn	400.00– 750.00	450.00– 950.00	50.00	200.00
Kansas City, Mo.	405.00– 630.00	500.00– 825.00	95.00	195.00
St. Louis, Mo.	420.00– 700.00	600.00– 1,032.00	180.00	332.00
Newark, N. J.	450.00– 900.00	580.00– 1,200.00	130.00	300.00
Albany, N. Y.	400.00– 700.00	500.00– 750,00	100.00	50.00
New York, N. Y.	[2] 900.00– 2,400.00	[2] 900.00– 2,400.00	——	——
	600.00– 1,440.00	600.00– 1,440.00	——	——
Rochester, N. Y.	300.00– 600.00	500.00– 800.00	200.00	200.00
Syracuse, N. Y.	300.00– 650.00	400.00– 700.00	100.00	50.00
Cleveland, Ohio	400.00– 750.00	500.00– 1,000.00	100.00	250.00
Columbus, Ohio	380.00– 617.50	450.00– 800.00	70.00	182.50
Dayton, Ohio	315.00– 630.00	500.00– 700.00	85.00	70.00
Portland, Ore.	550.00– 750.00	725.00– 1,100.00	175.00	350.00
Philadelphia, Pa.	[2] 950.00– 1,250.00	[2] 1,000.00– 1,300.00	50.00	50.00
	470.00– 870.00	520.00– 920.00	50.00	50.00
Pittsburgh, Pa.	400.00– 750.00	450.00– 900.00	50.00	150.00
Providence, R. I.	400.00– 750.00	500.00– 900.00	100.00	150.00
Spokane, Wash.	495.00– 720.00	600.00– 1,000.00	105.00	280.00
Milwaukee, Wis.	400.00– 900.00	540.00– 1,020.00	140.00	120.00

CITIES OF 25,000 TO 100,000 POPULATION

Waterbury, Conn.	$350.00– $650.00	$450.00– $800.00	$100.00	$150.00
East St. Louis, Ill.	400.00– 700.00	450.00– 800.00	50.00	100.00
Terre Haute, Ind.	425.00– 650.00	540.00– 680.00	115.00	30.00
Topeka, Kans.	360.00– 540.00	360.00– 855.00	——	315.00
Lewiston, Me.	300.00– 500.00	350.00– 600.00	50.00	100.00
Holyoke, Mass.	400.00– 700.00	450.00– 775.00	50.00	75.00
New Bedford, Mass.	475.00– 750.00	550.00– 825.00	85.00	75.00
Kalamazoo, Mich.	350.00– 500.00	400.00– 700.00	50.00	200.00
St. Joseph, Mo.	315.00– 592.50	450.00– 810.00	135.00	217.00
Butte, Mont.	650.00– 900.00	800.00– 1,050.00	150.00	150.00
Nashua, N. H.	350.00– 450.00	400.00– 600.00	50.00	150.00
Camden, N. J.	400.00– 640.00	500.00– 900.00	100.00	260.00
Schenectady, N. Y.	375.00– 550.00	450.00– 800.00	75.00	250.00
Youngstown, Ohio	300.00– 650.00	400.00– 900.00	100.00	250.00
Erie, Pa.	332.50– 570.00	380.00– 712.00	47.50	142.00
Pawtucket, R. I.	360.00– 600.00	400.00– 720.00	40.00	120.00
Columbia, S. C.	315.00– 405.00	450.00– 540.00	135.00	135.00
Salt Lake City, Utah	360.00– 720.00	480.00– 1,020.00	120.00	300.00
Norfolk, Va.	400.00– 650.00	450.00– 700.00	50.00	50.00
Tacoma, Wash.	500.00– 750.00	600.00– 1,020.00	100.00	270.00
Superior, Wis.	127.50– 665.00	475.00– 712.50	47.50	47.50

CITIES OF 10,000 TO 25,000 POPULATION

Selma, Ala.	$400.00– $800.00	$540.00– $810.00	$140.00	$10.00
New London, Conn.	300.00– 650.00	400.00– 700.00	100.00	50.00
Evanston, Ill.	600.00– 900.00	650.00– 1,000.00	50.00	100.00
Richmond, Ind.	475.00– 665.00	480.00– 850.00	5.00	185.00
Burlington, Iowa	285.00– 570.00	349.12– 628.42	64.12	58.42
Revere, Mass.	400.00– 600.00	450.00– 700.00	50.00	100.00
Ann Arbor, Mich.	325.00– 500.00	350.00– 725.00	25.00	225.00
Great Falls, Mont.	712.50– 760.00	720.00– 900.00	7.50	140.00
Portsmouth, N. H.	300.00– 500.00	400.00– 650.00	100.00	150.00
Plainfield, N. J.	475.00– 650.00	600.00– 1,100.00	125.00	450.00
Middletown, N. Y.	400.00– 600.00	500.00– 700.00	100.00	100.00
Sandusky, Ohio	300.00– 465.00	400.00– 650.00	100.00	185.00
Beaver Falls, Pa.	360.00– 513.00	360.00– 675.00	——	162.00
Cranston, R. I.	351.00– 507.00	390.00– 585.00	39.00	78.00
Walla Walla, Wash.	600.00– 750.00	700.00– 850.00	100.00	100.00
Parkersburg, W. Va.	340.00– 530.00	425.00– 675.00	85.00	145.00

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[1] Report of the committee on salaries, tenure, and pensions of public-school teachers in the United States to the National Council of Education. Published by the National Education Association, 1905.

[2] Men.

Minimum Salaries. — By the term "minimum salaries" is meant the fixing of an amount by the state below which local communities may not employ teachers. The first instance of such minimum wage schedule in the United States was in West Virginia in 1882. This law as amended now provides for a salary of not less than $40 per month for teachers having a certificate of the grade of number one, $35 for those having certificates of the grade number two, and $30 for those having certificates of the grade number three. Other states having such laws, together with the dates of first enactment and the minimal amounts now provided are as follows: New Jersey (1900, local option); Indiana (1901, a daily wage equal to three and one half cents multiplied by the general average of scholarship and success); Pennsylvania (1903, $45–$55); Maryland (1904, white teachers, annual $300); North Dakota (1905, $45); Ohio (1906, $40); North Carolina (1907, $35–$40); Rhode Island (1909, $400 per year). The principle of graduating the minimum salary in accordance with the grade of certificate held has been incorporated into all of these laws.

Another type of minimum salary regulation is that represented by the special provisions of the charter of the city of New York (effective 1899), whereby minimum schedules are defined in detail for service in the different classes of teaching positions.

Yet another mode of establishing minimum wage schedules is through legal provision, whereby a specified proportion of tax levies and state apportionments must be devoted to teachers' salaries. Such laws exist in California, Colorado, Oregon, and Utah.

Modern Problems. — The lines of economic influence that determine the conditions for admission, the quality of success, and the length of practice of individuals in professional pursuits are somewhat different for the profession of teaching from what they are for other professions. The demand for teachers, particularly for elementary and secondary schools, tends to exceed the supply. This excess demand, on the one hand, has diminished the rate of the upward movement of the generally low requirements for legal certifications for teaching that exist in most of the states; and, on the other hand, has created a most favorable opportunity for the professional activity of unmarried women. These tendencies in combination have operated against any normal increase of the rates of compensation.

The increasing proportion of women in the public educational service has developed, particularly in the large cities, where there has been a noticeable movement for organization for economic betterment, a new issue, — namely, equal salaries for men and women. The first and most conspicuous example of this is to be found in the so-called "equal salary" law enacted by the state legislature in 1911 for the public schools of the city of New York. Under this law men and women teachers rendering similar service in positions of the same grade must receive equal compensation from the board of education.

As all state education has a decided tendency to become monopolistic in character, the future economic situation of the public school teacher is bound up in the development of civic ideals, whereby the financial rewards of the teacher will be regulated not by the primary forces that govern material productive activities, but by the standards of worth of social service. E. C. E.

For teachers' salaries in other countries, see the articles on the various national systems in this Cyclopedia.

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TEACHERS' SEMINARS. — The term given to the institutions for the training of teachers in Germany. Those for the training of elementary school teachers are known as *Volksschullehrerseminare*, for secondary school teachers merely as *Seminar*, and the first of the two years of their training is known as *Seminarjahr* as distinguished from the second or *Probejahr* (*q.v.*).

See Germany, Education in; also Education, Academic Study of.

TEACHERS, SEX OF. — **United States.** — There were employed in 1910 in the common schools of continental United States 523,210 teachers, — 412,729 (78.9 per cent) women and 110,481 (21.1 per cent) men. The constantly decreasing proportion of men teachers during the past half a century has been a phase of the development of the public school concerning which there has been much discussion and controversy both in Europe and in the United States. The character of this decrease is displayed by the above comparative exhibit.

	Women	Men
	Per Cent	Per Cent
1870	61.3	38.7
1875	57.8	42.2
1880	57.2	42.8
1885	62.6	37.4
1890	65.5	34.5
1895	67.4	32.6
1900	70.1	29.9
1905	76.0	24.0
1910	78.9	21.1

Since 1870 the absolute number of men teaching in common schools has increased about 41 per cent, while the absolute number of women has increased 190 per cent.

Considerable variations in the relative proportion of men and women teachers are to be found in different sections of the country, in different grades of schools, and in rural and urban schools. In 1910 the five states having the lowest percentage of men teachers were as follows: Connecticut, 6.2 per cent; New Hampshire, 7.1 per cent; Rhode Island, 8.8 per cent; Vermont, 8.9 per cent and Massachusetts, 9.1 per cent; those having the highest percentage at the same period were: West Virginia, 48 per cent; Arkansas, 47 per cent; Kentucky, 41.7 per cent; Tennessee, 37 per cent; Indiana, 35.7 per cent.

The public high school statistics of the United States for 1910–1911 show that of the 45,167 teachers, 20,152 (44.5 per cent) were men, and 25,015 (55.5 per cent) were women. During the two decades between 1890–1891 and 1910–1911 the number of public high school teachers increased from 8270 to 45,167, an increase of 546 per cent. However, during the same period the proportion of men teachers remained nearly constant, 1890–1891, 43 per cent; 1910–1911, 44.5 per cent.

A statistical array for the teaching staff of the public schools of 467 of the 547 cities of 8000 population or more, made in 1904 by the special committee of the National Education Association, showed that women teachers constituted 74 per cent of the entire number of persons employed either as teachers or in supervisory positions; and that scarcely more then 2 per cent of elementary school teachers were men.

The United States occupation statistics of 1900 showed that in the one hundred and sixty large cities (population 25,000 and over) nearly five sixths (82.1 per cent) of teachers were women, while outside of these cities only seven tenths (70 per cent) were women. This difference between city and country in the sex distribution of teachers was found to obtain generally for the whole country, although in the southern states the percentage of men was about twice as great outside of the large cities as within them.

In the public schools of the United States women occupy many of the superior administrative and supervisory positions. The chief state educational office (1912) of three states (Colorado, Idaho, Wyoming) was held by women through popular election. In many states, especially in the central and western states, women serve as superintendents of local areas (county, townships). Several important cities in the country have recently had women as superintendents of schools.

Approximately nine tenths of the teaching staff of colleges and universities are men (1910). In public normal schools a trifle more than one third of the instructional force is composed of men. Other American professional schools contain practically no women teachers.

Other Countries. — The percentages of men and women serving in the public elementary schools of the principal foreign states in 1908 were as follows: —

STATE	MEN	WOMEN
	Per Cent	Per Cent
Austria	67.8	32.2
France	43.4	56.6
Prussia	80.4	19.06
Great Britain		
England and Wales	24.2	75.8
Scotland	27.1	72.9
Ireland	37.7	62.3
Italy	32.7	67.3
Norway	62.2	37.8
Sweden	62.0	38.0
Switzerland	59.6	40.4

General Features of the Problem. — Three features of the general problem of the sex of teachers — especially as this problem concerns public elementary and secondary schools — may be regarded as ranking factors of influence in education. Each of these — the social, the economic, and the pedagogical — will be described briefly.

Social. — The existing social order makes inevitable, for the great majority of women, a relatively brief term of industrial or professional service outside of the home. As a result, a very small proportion of the women who enter upon the work of teaching continue beyond the marriageable period. This circumstance means that a large number of comparatively immature and inexperienced women serve as teachers. Consequently compensation tends to remain on a low level, not only for women teachers alone, but for teachers as an economic group. These conditions of brevity of service and low compensation are inimical to the development of high standards of professional preparation.

Economic. — Historically, the nineteenth century movement of the expansion of the economic and professional activities of women outside of the domestic limits coincided with the expansion and development of the public school as a comprehensive social institution. Women in large numbers became teachers, because teachers in large numbers were needed; because of the social tradition of the relation of women to children; and, most important of all, because the service of women could be procured more cheaply than that of men. The comparatively rapid increase in the proportion of women teachers in the elementary and secondary schools in this country, and in the elementary schools of the principal European people having state schemes of education, may be ascribed primarily to the economic influences of low standards of compensation. The apparent tendency everywhere is for women to become, in increasing proportion, the teachers in state schools, because states have not yet thought it necessary nor found a way to pay men a sufficient amount to attract them from other vocations to teaching. The equitable adjustment of the salaries of men and women engaged in the same grade of public school service presents an unsolved question of the economic competition of the sexes. (See TEACHERS, SALARIES OF.)

Pedagogical. — Up to the present time no conclusive evidence has been produced as to the relative efficiency of men and women as teachers, or as to the pedagogical influence of the feminization of the teaching staff of common schools. Social experience with popular education has been too brief for any satisfactory settlement of the argument as to the relative pedagogical fitness of the sexes. The traditional attitude of the enlightened social mind as well as of the intelligent individual mind is to regard with suspicion any educational scheme in which, as is the case in the United States, the great majority of children are never, during their school career, in contact with a man teacher.

The theory of democracy would seem to demand a place for the woman as a teacher, but not a place to the exclusion of the man as a teacher. The equilibrium will be established partly through the recognition of the economic law that governs the proper compensation of sexes engaged in the same social service, and partly through the changes that are taking place in all forms of lower education, whereby emphasis is placed upon training in vocational technique that belongs largely to the industries of men. E. C. E.

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TEACHERS, TENURE OF. — See TENURE OF TEACHERS.

TEACHERS' TRAINING COLLEGES. — See TEACHERS, TRAINING OF.

TEACHERS, TRAINING OF — History. — The history of the training of teachers in the United States began with the academies (*q.v.*), and the earliest period of the normal schools was characterized by a conflict with the academies. With the normal schools well established, a third stage is marked by the development of city training schools. A fourth stage began with the establishment of training classes in high schools, and a fifth with the establishment of educational departments in universities and colleges.

(1) *The Academy as a Training School.* — In the founding of the first academy, the Academy and Charitable School of Philadelphia in Pennsylvania in 1756 (proposed 1743) under the auspices of Benjamin Franklin, one of the purposes specified was "that others of the lesser sort might be trained as teachers." Throughout the period dominated by the academy, this institution was the chief if not the only source of trained teachers, — trained only in the sense that they had received a somewhat more advanced course in subject matter than they were to teach. The academies, however, did not become conscious of their obligation in the training of teachers as a specific function until the second quarter of the nineteenth century. The modification of the curriculum of Phillips Andover at this time by the introduction of an English school was specifically for the purpose of training teachers for the common school. But it was in the State of New York that the academies took the most prominent part in the training of teachers. Here there was a definite rivalry between the academies on the one hand, and on the other the monitorial high schools founded on the Lancasterian system, for acceptance as the state system of training schools for teachers. The monitorial system (*q.v.*) was favored by the Governor, DeWitt Clinton, who, during the third decade of the century, repeatedly recommended the establishment of one such school in each county, with the training of teachers as one of its functions. But the academies were too well established, with local sentiment and interests in their favor. From 1813 the literary fund had been devoted to the support of the academies; from 1827 the establishment of teachers' training classes in specified academies was required and such courses were reported in some of these institutions from 1831. From 1834 such courses were organized into a definite system of teachers' training institutes. This law of 1834 was the first in any commonwealth of the union making provision for the training of teachers for the common schools. It was not until 1845, after a long period of agitation, that the establishment of a normal school was secured from the legislature, to be located at Albany. Others followed, all of them being converted academies except the one at Oswego, which had been a city training school. (See OSWEGO MOVEMENT.)

(2) *The Normal School.* — The origin of the term Normal School in the American usage was briefly traced in the article on NORMAL SCHOOLS (*q.v.*) to the decade of the thirties, when the influence of French and Prussian literature and experience became prominent. Interest in and attempts at the training of teachers, aside from their subject matter courses in the academies, was of an earlier date. Mr. Barnard traces the early appearance of this interest to the publication of *Suggestions on Education*, by William E. Russell in 1823; of a *Plan of a Seminary for the Education of Instructors of Youth*, by Thomas H. Gallaudet in 1825; of *The School Fund and the Common School of Connecticut*, by Professor J. L. Kingsley of Yale in 1823; and of *Observations on the Improvement of Seminaries of Learning in the United States: with Suggestions for its Accomplishment*, by Walter R. Johnson of Pennsylvania in 1825. These publications appearing about the same time but widely scattered in their place of publication, with others which followed shortly, indicate the widespread recognition of the necessity of some such effort. Aside from the monitorial training classes of the Lancasterian Schools (*q.v.*), the first practical step in the states was taken by Samuel R. Hall (*q.v.*), who opened a private school for the training of teachers in Concord, Vt., in 1823, after having given attention to this phase of "school keeping" for some years previous. This work continued until 1830, while in 1829 Mr. Hall published his *Lectures on School Keeping* widely circulated thereafter. But to James G. Carter (*q.v.*) has usually been given the title of "Father of Normal Schools," in America. During 1824–1825 he published numerous articles and appeals, and in 1827 he opened a school for the training of teachers at Lancaster, Mass., petitioning the legislature for aid. In 1835, becoming a member of the Massachusetts legislature, and in the following year chairman of the education

committee, he there urged the establishment of a training school or "seminary" for teachers. He was influential in securing the establishment of the state board of education in 1837 and the passage of the Normal School act in 1838. To Charles Brooks (*q.v.*) who disseminated a knowledge of the Prussian educational system and advocated on the basis of this example the establishment of such a training system in Massachusetts, and to Mr. Edmund Dwight, who gave $10,000 on condition that the legislature would appropriate a similar sum for the founding of such an institution, much credit is also due. The resolution accepting Mr. Dwight's offer and appropriating state funds became a law April 19, 1838. The first public normal school in America was opened on July 3, 1839, at Lexington, Mass., under the principalship of Rev. Cyrus Pierce (*q.v.*). A similar one at Barre was established at the same time.

Meanwhile in other states a similar agitation had been going on. In Pennsylvania there were numerous advocates of a similar plan, including publicists, college presidents, state officials, and legislators. In Connecticut, where the discussion concerning normal schools had begun as early as 1825, nothing resulted until 1838 when a board of commissioners for the state was established, with Henry Barnard (*q.v.*) as secretary. Mr. Barnard, through his reports and the *Connecticut Common School Journal*, established in 1839, agitated for the establishment of such a school. While the plan was approved by the legislature in 1846, it was not until 1849 that the act establishing the school was passed.

The discussions carried on in the meetings of the American Institute of Instruction (*q.v.*) founded in 1830, the oldest American educational association, were a strong factor in bringing about a professional demand for such institutions. The *Annals of Education*, edited by Mr. Woodbridge (*q.v.*), and similar publications, as well as some magazines and papers not of a professional character, also became important factors in formulating a professional demand and a public acquiescence and approval. The example set by Massachusetts, Connecticut, and New York was soon followed by Pennsylvania, at Philadelphia in 1848, by New Jersey at Trenton in 1855, by Michigan at Ypsilanti in 1850, and in time by all other states except two. Meanwhile private normal schools continued to develop, became very numerous, and near the close of the nineteenth century were important and valued factors in the training of teachers. With the founding of numerous state normal and city training schools, the true opportunity for private-venture normals became much curtailed, and the character of their work gradually fell below that set by state and municipal institutions.

City Training Schools. — This is the simplest form of the normal school and in one sense the earliest, since the earlier ones grew out of the model classes of the Lancasterian monitorial school systems. Such schools were established in New York and Philadelphia during the second decade of the nineteenth century and in fact were constituent parts of the monitorial system (*q.v.*) wherever established. Before the fourth decade of the century, however, the monitorial system supported by quasi-public societies had been merged into city school systems. In Philadelphia in 1848 a Girls' Normal School was established in place of the monitorial training class, and this eleven years later became the Girls' High School. In 1852 a normal school was established by the school board of Boston and in 1867 the New York City school board established a similar institution which twenty years later became the Normal College for Girls. The Oswego Normal, established in 1861 as a city training school and five years later accepted by the state, was probably the most influential city normal school. (See OSWEGO MOVEMENT.)

High School Normal Training Classes. — These schools are not intended to take the place or to do the work of the regular state normal schools. Their purpose is rather to provide limited instruction in pedagogical courses for beginners, in such work as the high schools and academies can offer, and to prepare their students for the work of teaching in the rural schools of the vicinity. In a sense they also serve as preparatory schools for the normal schools of the state. The course is one year long, consists of a review of the common school branches which the students will be expected to teach in the rural or village schools, with a little pedagogy, school management, and practice in teaching. This type first developed in New York and grew out of the work in the training of teachers in academies. With the providing of normal schools this work in academies and later in high schools was continued. In 1899 the supervision of these classes was transferred from the board of regents to the Department of public instruction. There are at present over one hundred such classes in the better high schools and academies of the state, to which the state makes grants aggregating more than $100,000 each year. Wisconsin in 1889, Nebraska in 1907, Virginia in 1908, adopted similar systems the details of which are given in the articles on these states. The Indiana law of 1907 has a similar purport, though it has affected colleges rather than high schools.

Educational Departments in Universities and Colleges. — These began with an agitation for the establishment of such departments in Amherst College in 1826, the formal establishment of one in Washington College in 1831, and the actual formation of an influential one in New York University in 1832. However, it is only in recent times that this phase of the training of teachers has been of great significance. The entire subject is discussed in detail under EDUCATION, ACADEMIC STUDY OF.

UNITED STATES. — Present Status. — Many of the men and women now teaching in the public schools of the United States have never had any definite professional training in preparation for teaching. It is still possible in many states for those who have completed an elementary school course to be certificated as teachers after a minimum of preparation, consisting largely in a review of the subjects commonly taught in the elementary school. Many others prepare for teaching by adding to this somewhat more adequate knowledge of the subject matter of the elementary school, a course of professional training of from six to twelve weeks. Teachers who possess this minimum amount of training are commonly found at work in the rural schools. The preparation usually required for those who teach in the urban districts varies from a normal school course of one or two years beyond the elementary school course, to a two-year professional course for those who have graduated from high schools. There are a few cities which are making a somewhat higher demand upon those who are trained within the city system. A notable example is found in the work of the Teachers College of the University of Cincinnati, which offers a four years' course beyond the high school work which is required of all who would enter the profession of teaching in that city. College graduation which includes some professional work is quite commonly required as a preparation for teaching in high schools. The courses in some of the normal schools are four or more years in length. It is fair to assume, however, that not more than two years of these longer courses should be considered professional, since the longer normal school course generally provides training parallel to that given in high schools.

Teachers are trained in the United States to-day in state and private normal schools, in city training or normal schools, in county training schools, in professional courses given in high schools, in summer schools, and in correspondence courses. There is a very great variation in the quality of work and in the length of course offered in these different types of institutions. In states having a well-organized system of high schools, the state normal school demands graduation from the high school for entrance, and offers a two-year professional course. In other states, a great variety of courses, varying in length from one to five years, are found. In these schools, the length of the course is determined partly by the grade of work which has been completed before entering the normal school, and partly by the position for which the student is preparing. City training schools commonly require high school graduation for entrance, and offer courses varying from one to two years in length. County training schools are organized primarily for the training of rural school teachers. The courses are usually one year in length. The professional courses given in connection with high schools are planned commonly to offer a year's professional study, either as a part of or at the end of the high school course. This article will be devoted mainly to a consideration of the provision made for training teachers in our state normal schools, and to the training of teachers in service.

State Normal Schools. — State normal schools are supported by appropriations granted from session to session of the state legislature. They have not commonly received sufficient money to enable them to compete with the universities, either in securing men of first-rate ability as teachers, or in equipment comparable to that found in the higher institutions of learning. Of course there are exceptions to both of these generalizations. A study of the situation during the past twenty years will show that an increasing proportion of those who teach in normal schools have received at least their bachelor's degree, and that a few men and women with unusual preparation are being secured by the more progressive schools for their more important positions. The study of education in our universities has provided a number of men and women who have gone into the professional work in the normal schools splendidly equipped by virtue of their study of education and allied subjects. Indeed, certain phases of the work now done in university departments of education, notably at Columbia, Chicago, and at a few of the state universities, may be considered as offering essentially the training necessary for the preparation of normal school teachers.

Curriculum. — Any consideration of the courses offered in our normal schools must take account first of the great variety of preparation offered by those who enter the schools, and second of the many-sided function of the normal school. There are normal schools that are concerned in large measure with the preparation of their students for entrance to college. It is true that in these schools some professional work is done, and that many, possibly even all, of the students will do some teaching. The normal school must, however, conform to the requirements of entrance to college, since very many of the students look upon teaching as merely a temporary occupation which is to enable them to secure a college education. Among the strictly professional courses, the student with only elementary school training chooses in many schools a one-year professional course which will enable him to secure the lowest grade of certificate issued in the state; an elementary course of two years which will include more academic work; or a four-year course which will entitle him, after successful teaching experience, to a life certificate. High school graduates in the same school might take a one or two years' professional course which will also lead to the life certificate. In the same school special courses for teachers of kindergarten, domestic science, music, and fine art may be found. There are still schools which offer a commercial course, which is intended primarily to equip boys and girls for business positions. The normal school at Salem, Mass., has a course for the training of commercial teachers.

Academic Work. — The academic work done in normal schools is not commonly of as high a grade as that done in our better colleges. Under the head of academic work as contrasted with professional work, these schools quite frequently spend from a third to a half year in reviewing the subjects that the student has already covered in his own elementary or high school course, the purpose being to insure some adequate knowledge of the subject, and to consider the problems involved in its teaching. Those courses which are in advance of the work already covered suffer from the fact that the teachers are frequently not particularly well trained; from the fact that most normal school teachers are very much overworked, carrying not infrequently a program of from twenty to thirty hours a week; and from a lack of any adequate grading of the student body upon the basis of knowledge or ability in the subject. These criticisms do not, of course, apply with equal force to the normal schools which receive only high school graduates, nor do they apply to a few of the very best schools receiving students with a greater variety of preparation. The students from the better normal schools receive full credit upon entrance to our leading colleges and universities for the time spent in normal schools beyond high school graduation.

There is need for normal schools to introduce a kind of academic work which looks toward the special equipment of those who are to teach children. There should be not simply courses in English, but also courses in child literature; not merely a knowledge of biology, but courses planned especially with reference to the work which can be offered to children in biological and physical nature study. In history, geography, music, and, indeed, in practically every subject taught in the elementary school, the student ought to study the field from the standpoint of the material available and the method to be employed in teaching children. This work may be just as significant from the standpoint of scholarship as is any of the work now done in the normal school. It ought to result in an appreciation of the subject to be taught as a possible means of mental growth for children.

Professional Work. — The professional work in the normal school consists usually in the study of psychology, the application of psychology to teaching in a subject commonly called pedagogy, the history of education, observation and criticism of schoolroom practice, and practice teaching. Of these several subjects more time is given to practice teaching than to any other. It is quite common in normal schools to devote as much as five hours a week for the larger part of the whole year to practice work. In some schools this work is concentrated in a half or a third of the year, so that the student may devote practically all his time to practice teaching during this shorter period.

The work in psychology, pedagogy, and the history of education is quite commonly taught by those who have not had advanced training in these fields. It is not unusual for the principal of a normal school to teach one or more of these subjects, even though he may previously have been a teacher of mathematics or science or of some other subject not directly related to this professional field. Happily in the better schools men who have been specially trained in psychology and in education in our universities are being called to take charge of these professional courses.

Practice Schools. — The work in practice teaching is commonly preceded by work in observation of class teaching in connection with the courses in pedagogy or in a special course in observation. Normal schools usually have under their control a practice school in which observation and practice work is done. In a few of the schools students are sent out to the regular public school system which is nearest at hand, and placed either under the supervision of special teachers designated as training teachers, or under the control of a special supervisor sent out from the normal school. A few normal schools plan to give their students practice in rural schools by affiliating one or more rural schools with the normal school, or by having an ungraded school on the normal school campus to which children from rural districts are transported.

At the head of the practice or training school is usually found a man who is, by virtue of his position, second in importance and in authority to the principal of the normal school. He usually gives the courses in pedagogy. The man who presides over the training school has the problem of coördinating all the departments of the normal school in their relation to the student's practice teaching and to the education of the children found in the school. He must be able to secure the coöperation of the several academic departments in the making of the course of study, in the outlining of work for students in training, and in the actual supervision of the teaching which the students do. Too frequently this effective coöperation is lacking, and the head of the training school, together with the critic teachers who directly supervise the work of practice teachers, is responsible for everything that takes place in the training school.

Observation and Practice Work. — The organization of practice work varies among even the better schools of the country. In some schools the student is introduced to the problems of classroom instruction through observation and experimental teaching early in his course, while in others the period of practice work is postponed until practically the end of the student's course in the normal school. In some schools the work is always done under very careful supervision, and after careful plans have been criticized by critic teachers or others. In other schools the student attempts to teach the whole curriculum, and is given very great responsibility from almost the beginning of his practice work. It would seem wise to provide some careful observation and some little contact with children by means of helping regular teachers or by the teaching of a few carefully planned lessons early in the normal school course in order to make more significant the theoretical study which is to follow. In any event, it is an unwise provision which places the beginner in a situation in which keeping order and attending to routine matters of management come to be thought of as the whole teaching. To learn to teach is to attain some appreciation of the subject taught as a possible method of mental growth and development for children. The beginner should have most of his energy focused upon the application of those principles of teaching which he has studied, and not upon the easiest way to keep children quiet. After the beginner has gained some confidence and has succeeded in teaching a small group of children, it may be possible gradually to introduce conditions which more nearly approximate those which are found ordinarily in our public schools. It cannot be too strongly urged, however, that this grappling with the actual school conditions should be the end and not the beginning of practice work.

Training of Secondary Teachers. — It is only within the past decade that any considerable number of those who expected to teach in secondary schools had any preparation for their work other than that gained by the pursuit of the regular academic work of the college or university. Apparently it was the firm belief of all concerned that knowledge of the subject to be taught was all that was necessary by way of preparation for teaching. At the present time in most of our colleges and universities, professional training is provided in educational psychology, in the history of education, and in the philosophy of education, together with some special training in the methodology of the particular subject or subjects which the student is preparing to teach. Along with these theoretical courses have been organized courses in observation and in practice teaching. The professional work begins commonly in the junior year, and is continued in the senior year. From one half a year to a full year is devoted to these professional courses. For the details of system or custom in each state, see the sections on the training of teachers in the articles on state systems (*i.e.* Alabama; Arkansas; *etc.*). See also EDUCATION, ACADEMIC STUDY OF.

Improvement of Teachers in Service. — Because of the inadequate training of those who begin to teach in our public schools, and because of the fact that those who succeed in any line of professional endeavor are those who continue to be students of their field, a large part of the training of many teachers is secured after they enter the service. The work of the supervisory corps in American cities consists primarily in providing for the growth and development of the teachers with whom they work. The training which is offered to those who are engaged in teaching consists mainly of two general lines of work; first, further theoretical professional training, and second the development of the art of teaching.

Theory. — The professional training of the theoretical sort given to teachers in service is organized mainly in connection with teachers' institutes (*q v.*), teachers' study classes, and in reading circles (*q.v.*). In the institute of the better sort, teachers quite commonly do work which is comparable to the professional study undertaken in the summer school. Professional books are read, recitations are discussed with regard to principles of teaching, psychology, and school management, and the organization of the several subjects of the curriculum is undertaken under the direction of supervisors or other competent leaders. Likewise, in the work of reading circles and study classes, professional books are read, meetings are held for discussion, and examinations are given, which in some cases are credited toward the higher standing which the teacher desires. In some systems of schools, promotional examinations involving professional study as well as successful classroom work are demanded of those who would receive additional salary beyond the maximum achieved after a brief experience. In other systems encouragement to professional study is offered by examinations which are held for positions of higher grade.

One of the most significant agencies used for the training of teachers in service is the making of the course of study. In some systems of schools the superintendent and other supervisory officers have enlisted the coöperation of teachers from year to year in the preparation of the courses of study. The teachers of each grade meet, for example, to criticize and suggest changes in the present course of study in arithmetic. As a result of their conferences, a report is sent to a committee of supervisors and others specially equipped to judge of the work in this field, which, after examination and correction, is sent back to the teachers from whom the original suggestions came. Such work done from year to year, now with one subject and again with another, offers a plan for professional training superior to that undertaken in most teachers' meetings or reading circles. There is the added advantage of having the teacher appreciate the fact that her advice and help are considered necessary by the administration.

Practice. — In developing skill in teaching, there is a broad recognition of the importance of demonstration. In teaching, as in other arts, imitation must play a very considerable factor. To this end many of our supervisors have organized demonstrations attended by small groups of teachers of the same grade in which the lesson is taught in order that a new type of work or class management may come to have the validity which is found only after such a demonstration. Commonly after the supervisor or capable teacher has taught the lesson or lessons, a period either on the same day or later is devoted to a discussion of the work done. Sometimes stenographic reports of lessons which have been observed are used as an aid to the later discussion. Another method of demonstration is found in carefully selecting teachers who have peculiar strength, and asking other teachers to visit them, with special reference to some type of work in which they may need help. The success of visiting depends almost wholly upon this definite direction to the visiting teacher to see some one phase of another teacher's work, and upon providing for the discussion at a later time of the work observed. Again, the work of supervisors of special subjects is often significant mainly by virtue of the fact that these supervisors teach in the presence of the regular teachers, and thus furnish an example of the kind of work which they wish to have done.

Other Means. — Apart from these two main types of training, namely theoretical professional study and demonstrations of the art of teaching, other methods are employed which are intended to stimulate or encourage teachers. In some systems teachers are rated as to efficiency by the supervisory corps at regular intervals. This rating may determine advancement in the system, with regard to both salary and position. In some systems special aid is offered to those who go to summer schools or special credit toward a higher license or certificate is given to those who take work in extension classes. In Boston the sabbatical year (*q.v.*) with half pay has been provided for teachers throughout the school system. Teachers' meetings, local, state, and national, are maintained by teachers whose professional zeal may not be questioned. Voluntary teachers' associations are beginning to carry on investigations and experiments which indicate not only professional interest but also insight and ability of no mean degree.

With a teaching population made up very largely of women who spend only from one to five years in the profession, the problem of training teachers in service must always be an important consideration. While it may be expected that the degree of training demanded of those who enter the profession will continue to increase, the improvement of those who supervise and direct the work of teachers must be regarded as of primary importance. When the leaders in the profession are adequately trained, a higher degree of efficiency upon the part of those who are supervised by them may be looked for. It is to be expected in the near future that professional training, either as a part of the regular college course, or as a supplement to the work for the bachelor's degree, will be required of all who are to undertake work as supervisory or administrative officers in our public school systems. G. D. S.

England and Wales. — *History.* — Prior to 1800 there was practically no system of training teachers in England. Yet many of her writers upon Education — Mulcaster, John Lily, Edmund Coote, John Brinsley, and Charles Hoole (*qq.v.*) — had either outlined systems for training or had written scathingly upon the inadequate preparation of professing teachers. The Society for Promoting Christian Knowledge (*q.v.*) proposed the foundation of an institution for the preparation of masters in 1703, but little seems to have been done. The writings of Shenstone, Gray, Cowper, Crabbe, and Adam Smith during the eighteenth century aroused England from her apathy toward social and educational problems, and at the beginning of the nineteenth century steps were taken to give a little professional training to teachers. This took the form of what has since been called the "Monitorial System" (*q.v.*). Although the system of Lancaster differed slightly from that of Bell in the matter of details, the fundamental principles of the two were the same. Both were anxious to obtain a large supply of teachers, and both were unable to do so. Hence they began to train the older and brighter boys for the office. The system demanded mechanical and routine class management, and this ultimately led to an excessive use of emulation and rewards. Lancaster was supported by his coreligionists — the Quakers — and by other nonconformists; Bell by members of the Church of England. The former founded (1808) the Lancasterian Society which developed in 1814 into the British and Foreign School Society (*q.v.*); the latter founded in 1811 the National Society for the Education of the Poor in the Principles of the Established Church throughout England and Wales (*q.v.*).

The later English movement for the training of teachers developed with great rapidity after the first government grants for education in 1833. Finding a serious lack of competent teachers, the government attempted to remedy the matter by voting a sum of £10,000 for the erection of "model" schools. Although the money was voted in 1835, it was not until the formation of the Committee of Council on Education in 1839, to administer the moneys voted by the Commons, that any action was taken.

The question of a national normal school was one of the first things discussed by the new Committee of Council. Sir James Kay

Shuttleworth (*q.v.*), the enlightened and energetic secretary, was greatly in favor of the national scheme, but the obscurantist tactics of the two rival societies, the British and Foreign and the National, were sufficient to make the plan abortive. The moneys were accordingly divided between the rivals to enable them to erect training colleges for teachers.

About this time a new principle was introduced into the education of the English schoolmaster. This was the pupil-teacher system which was introduced by Kay Shuttleworth from Holland. At bottom it was a development out of the monitorial system which had by this time become a notorious failure. The pupil-teacher was a young person who was apprenticed for five years to a head teacher, from whom he received gratuitous instruction and a small salary in return for services rendered in the schoolroom. The professional side of training was emphasized; the academic instruction was reserved mainly for the training college, which was entered at the close of the apprenticeship. In order to meet the expense of training the Committee introduced "Queen's Scholarships" in 1846. An examination was held to select the "scholars," who subsequently received £20–£25 a year during their two years of residence in college. In 1848 there were only 200 pupil-teachers; in 1861 the number had risen to 13,871; and in 1870 to 14,612.

From 1870 the apprenticeship system gradually declined and was replaced by the pupil-teacher center system (1874), by means of which the apprentices received a better academic preparation than was possible previously. The breakdown of the system was also hastened by raising the age of pupil-teachers — from 13 to 14 in 1878, to 15 in 1896, and later to 16 (15 in country districts) — and by diminishing the period of apprenticeship by gradual stages from 5 years to 2 years.

Since 1905 the pupil-teacher system has been rapidly replaced by the bursar (*q.v.*) and student-teacher system (*q.v.*). This latter system is organized to provide intending teachers with a secondary education up to sixteen or seventeen years of age, followed by one year of practical teaching in an elementary school under the supervision of the head teacher, before entrance to a training college is allowed.

Another feature, which is unique in educational organization, was the formation of day training colleges in connection with universities in 1890. The scheme, following the recommendations of the Cross Commission (1886–1888), was entered into with great trepidation, but it has surpassed all expectations. No new residential college has been built since 1890, while day training colleges have been founded in rapid succession. The university field is now exhausted in this direction, and the latest development of the movement is the organization of day training colleges under the control of city or of county councils. The past few years have seen great activity in this field of endeavor, and at the present time one quarter of all teachers are trained in institutions of this type.

Preliminary Training. — The preliminary training extends to seventeen or eighteen years of age. The bursar and student-teacher system has practically replaced the pupil-teacher system of training, although both systems are in operation. The following comparative table shows the working of the two systems.

Pupil-Teacher System		Bursar and Student-Teacher System	
Ages	How Engaged	Ages	How Engaged
5–12	Pupil in elementary school.	5–12	Pupil in elementary school.
12–14	Pupil in elementary or secondary school.	12–16	Pupil in secondary school.
14–16	Pupil in secondary school or in pupil-teacher class.	16–17	Bursar in secondary school.
16–18	Pupil-teacher studying part time in centers, and teaching part time in the elementary school.	17–18	Student-teacher in elementary school, or a student in a training college.

The curricula of centers and secondary schools with bursars are dominated by the entrance examinations to training colleges. The chief of these examinations is the preliminary examination for the elementary school teacher's certificate, which, in general, is the entrance examination for all colleges not constituent parts of universities or university colleges. It is also the qualifying examination for recognition as an uncertificated teacher; and is the direct successor of the Queen's (afterwards the King's) Scholarship instituted in 1846 and abolished in 1907. The others are the various matriculation examinations of the universities, or other examinations of equal difficulty.

Pupil-teachers, bursars, and student-teachers receive maintenance scholarships or their equivalent, and the institutions in which they are trained receive per capita grants from government.

Training Colleges. — After the completion of his preliminary training, the intending teacher may enter a training college (the phrase "normal school" is practically lacking in English educational terminology) for one, two, three, or four years, the usual period for council and residential colleges being two, for university training colleges, three, or four for those which accept the latest government scheme. The students are carefully selected, but none may be refused admission on religious or social grounds. In 1910–1911 there were 12,100 teachers in training, distributed as shown in the subjoined table.

TEACHERS IN TRAINING IN ENGLAND AND WALES, 1910–11.

Type of Institution	Resident Students		Hostel Students		Day Students		Totals
	Men	*Women*	*Men*	*Women*	*Men*	*Women*	
University Training Colleges. Departments of Education (18 Institutions)			110	360	1,629	1,169	3,268
Council Training Colleges. — City and County (18 Institutions)		158	162	596	664	1,526	3,106
Voluntary Training Colleges — Denominational (47 Institutions)	1586	3,656	—	137	84	263	5,726
Total (83 Institutions)	1,586	3,814	272	1,093	2,377	2,958	12,100

All colleges are under the jurisdiction of the board of education, which provides grants to cover part cost of erection (75 per cent of cost) and the whole of the maintenance charges. Partial maintenance grants to students are also given. To prevent the misappropriation of these comparatively large sums, each student on entering a college is required to sign a "form of undertaking," binding himself or herself to teach for seven out of the first ten years, if a man, and for five years, if a woman, in a school under the control of the board, or, failing to do so, to pay back a proportionate part of the cost of training.

The curricula of training colleges vary greatly, for great freedom in choice of subject matter is permitted by the board. Only suggestions for courses are given: if the head of a training college can make a better syllabus, he is quite at liberty to do so. The curriculum for a college with a two years' course includes the following subjects: English language, literature, and composition; history and geography; elementary mathematics; hygiene; theory of music; principles of teaching; elementary science; the practice of teaching; reading and repetition; drawing; needlework (for women); singing; physical training; and manual instruction (for men). The subjects are divided into two parts — the first six in which the students are examined individually, and the last eight in which the proficiency of the college as a whole is tested during the visits of inspectors. Drawing, manual instruction, and physical training may be omitted by those students who have had satisfactory training in those branches before entering college. Not more than two optional subjects from a list of twenty may be included in the course.

In those education departments where the normal course of training is three years, a considerable modification of the above is made. In the first place, the student always studies for a university degree, which is obtained normally at the end of the third year. The professional training is pursued at the same time and overpressure is often a result. To remedy this, the board has instituted (1911) a four-year course of training for students in universities. The first three years are to be devoted almost wholly to academic work; the fourth to a post-graduate professional training. This latter scheme is in operation in the Universities of Manchester and London and will, in all probability, become general in the course of a few years. (See *Report of the Board of Education for 1910–1911.*)

The weakest part of the course of study is the lack of attention to psychology and the history of education. Only three and four year students receive instruction in the history of education, while psychology is taught, for the most part, in a perfunctory manner. The practice teaching, which is only of six, eight, or twelve weeks' duration, is also an unsatisfactory feature of the course. When the pupil-teachership was in vogue, a student entered college with a good background of practical experience; at the present time he may enter without having taught a single lesson. Changes are contemplated, and we may look forward in the near future to the establishment of efficient demonstration and practice schools in organic connection with each training college.

Most of the residential colleges are small, few having more than 150 students. Day training colleges, though much larger, approximate the organization of residential colleges through the institution of hostels. Consequently the social life, which largely centers around the common room and the athletic field, is healthy and vigorous. Nor is it disturbed by religious faction, although the denominational colleges may reserve one half the total number of places for students of their particular religious persuasion.

Certification. — Certification at the end of the course is dependent upon (1) an examination in academic subjects, and (2) inspection by the board in the professional subjects of the curriculum. The examination may be given by the board or by some joint examining body approved by the board. The degree of a university may be substituted by all training colleges with three or four year students for the examination by the board in academic subjects. The individual colleges may also publish lists of their students in classes or in order of merit, but for these the board assumes no responsibility. In all cases, however, the staff of the training college participates in the certification of the students; the board's inspectors simply insure that the privilege is not abused and that reasonably high standards are maintained.

The certificate examination of the board may be passed by acting teachers who have never been to a college to be trained. Hence in 1909–1910, out of the 171,589 teachers in England and Wales, only 53,331 were trained and certificated, while 44,060 were certificated but untrained. The remainder were neither trained nor certificated. As the average attendance of scholars for the same year was 5,364,106, the average number per teacher was 31.3.

Training of Teachers in Service. — There is very little in England and Wales of what is known as the training of teachers in service. Supervision, as it is understood in America, is quite unknown in England. Only a few populous centers like London have an adequate supervisory force. Such supervision as exists is exercised by the head teacher and by His Majesty's inspector in a series of intermittent visits. Summer schools, reading circles, and other organizations for giving further training to acting teachers are much less numerous than in America. Still the nearness to the Continent has stimulated teachers, chiefly secondary, to attend the holiday courses provided by many foreign universities. The summer courses organized at home are chiefly patronized by foreigners and specialist teachers.

Secondary and Other Teachers. — The foregoing remarks apply almost wholly to the training of teachers for elementary schools. The organized training of secondary teachers is still in its infancy, but the resuscitation of the Teachers' Register, which was discontinued for a number of years, will probably give it a new impetus. (See TEACHERS, REGISTRATION OF.) The training of teachers for secondary schools extends at most to a post-graduate year in a university. At the end of that time a diploma is granted which is recognized by the board. Since 1908 the board has given financial assistance to institutions training secondary teachers, and there is a rapid development of this branch of work. About one third of the total number of secondary teachers have had some training, but only one eighth have been trained for the specific work they are now engaged in.

Teachers of domestic subjects are now trained in large numbers in institutions situated in large towns and under the control of the local education authorities. The student attends for one or two years and at the end of the course sits for one or more of the five diplomas recognized by the board. In 1909–1910 there were in England and Wales fifteen training schools recognized by the board, with a total of 903 students in training.

The only training college for art teachers directly maintained by the board is the Royal College of Art, London. The Art Class teacher's certificate and the Art Masters' certificates are, however, qualifications controlled and recognized by the board.

Kindergarten teachers, teachers of educational handwork, teachers of physical education, etc., must, for the most part, obtain professional training in institutions not under the jurisdiction of the board. A new era is, however, beginning. Teachers of young children may be trained in ordinary training colleges; a physical training college for women — a constituent part of the Southwestern Polytechnic at Chelsea — now receives grants; and the Board is represented by two members upon the Board of Examinations for Educational Handwork. P. S.

See ENGLAND, EDUCATION IN; WALES, EDUCATION IN.

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TEACHERS' VOLUNTARY ASSOCIATIONS. — Organizations of teachers, composed wholly or in the main of teachers, for any object connected with the profession, other than pecuniary benefit. But no hard and fast line can be drawn between such associations and those composed of educational experts and administrators, or general educational associations (*q.v.*), or learned societies.

United States. — The present associations in the United States are in some instances differentiations out of the old educational associations (*q.v.*) that inevitably came about as soon as schools required specially trained teachers. Thus the grammar school men of Massachusetts and Connecticut withdrew from the American Institute of Instruction to form their state associations in 1845 and 1846 respectively. In other instances they are the direct successors of earlier educational associations which died out when the conduct of schools was largely handed over to the teaching profession. This was the case with most of the state associations. While teachers' associations naturally enjoy much more permanence they lack one element of strength possessed by the more general organizations. The latter included in their active membership statesmen and national leaders of thought. They molded public opinion in a way that the present teachers' associations never attempt to do. Indeed, so pronounced is this defect of teachers' associations that of late in several Southern states, notably Texas, Kentucky, and Virginia, a determined effort has been made to revive the educational association type of organization.

Teachers' voluntary associations in the United States are of two main types: (*a*) general associations embracing teachers and educational administrators, and aiming to promote all interests of teachers; (*b*) specialized associations, composed of one kind of teachers and specialized around some phase of subject matter, of teaching method, or particular interest of teachers. There are numerous associations of both types covering the various geographic and administrative units of the country. Of the general associations, the only one embracing the entire country is the National Education Association. The most prominent interstate organizations are the American Institute of Instruction and the Southern Education Association. Every state, with one or two exceptions, has a state association and practically every city of importance has a general association. A complete description of the state associations will be found in the article by Foos given in the bibliography.

The earlier associations, particularly the American Institute of Instruction and the National Education Association, devoted themselves mainly to promoting the cultural and professional interests of their members, and to educational propaganda. They were only secondarily concerned with the economic betterment of teachers. But with the establishment of public schools on a firm foundation in the nineteenth century, many of the things which teachers formerly were compelled to look after for themselves are now carried on by school officials. Accordingly, the aims of the associations and their methods of work have changed considerably. At present in the voluntary associations of the United States, four tendencies are very marked: (1) differentiation into minute subdivisions which specialize along very narrow lines of interest. (2) An increasing interest in the promotion of educational legislation. (3) Much greater emphasis upon bettering the economic condition of teachers. (4) The increasing prominence of women in the associations.

The associations differentiate into sections or independent bodies that each newly formed group may the better pursue the peculiar interests of its members. Historically, differentiation was of comparatively little importance until about 1880, became a serious matter in the nineties, and is still going on at a rapid rate. Specialization within general associations is on the increase, as shown by the rapid growth of the number of sections from year to year in the newer associations of the western states. In the older states the tendency seems to be for the sections to become more and more independent of each other; that is, to form practically isolated associations that for some purposes, such as reducing expenses, may come together for a joint meeting, but are really independent. This separation of the associations makes it very difficult at times to get the coöperation of any large number of teachers for any matter of interest to teachers in general. The resulting weakness is very apparent whenever educational leaders attempt to get the support of teachers for legislation connected with the advancement of the profession at large. So pronounced has been this differentiation that special effort has been made to overcome it by federating associations of teachers, notably in Ohio and California, and in Boston, Philadelphia, and New York.

Differentiation and specialization in the associations are inevitable and on the whole highly desirable. The movement, when not carried to too great an extreme, enlists many more teachers in active associational work, does not destroy professional consciousness, introduces definiteness and specific aims into the work of the associations, and brings about a better balance of professional interests. The best form of differentiation would probably be that of general associations, with numerous sections, to cover the largest practicable areas, electing representatives to serve in corresponding sections of still higher general associations covering still larger areas, the whole culminating in a truly effective national organization.

The associations interested in legislation are naturally those covering areas which are units for educational legislation, — state and city associations. All state and many of the city associations (the latter tending to show much greater activity as the cities increase in size) attempt to influence legislation. The state associations are largely concerned with general administrative legislation for the betterment of schools and the raising of standards in the profession, and only secondarily with attempts to bring about economic betterment of teachers. This last field is practically the only one in which the city associations are attempting to influence legislation.

On the whole, the state associations exert little influence upon legislation, but those of Indiana, New Jersey, California, Virginia, and Colorado are noteworthy exceptions. The city associations in the larger cities, particularly in Philadelphia and Chicago, are proportionately much more successful. The small influence exerted by the associations in this field is in the main due to lack of means for securing permanent coöperation of teachers, which in turn is due to lack of permanent organization, of a constant personnel in a profession so largely made up of women who teach only a few years, and of well-organized schemes of representation.

The movement for economic betterment of teachers is spreading from the cities where it originated and is very active, to the states, where many associations are now working on it. The National Education Association attempts little here, although in 1905 it did publish an elaborate investigation into the whole field. The attempts to give merely temporary help, such as that afforded by mutual aid associations and employment bureaus, have largely disappeared and are being replaced by persistent efforts to secure permanent relief through adequate salary schedules, pensions, tenure of office, etc.

In methods of achieving results, the associations are abandoning weak and ineffectual appeals to the general public and voluntary makeshifts supported by their own members. Instead, they are trying to make adequate investigations of conditions and possible remedies, to secure the active coöperation of all teachers, and to make aggressive campaigns with the object of shifting the burdens of raising funds from teachers to city and state administrations. While a few years ago the action of the Chicago Teachers' Federation in proposing affiliation with the labor unions precipitated a scare that trade unionism would spread rapidly among the associations of the country, the excitement has died down. In 1910 there were only two teachers' associations in the United States affiliated with the American Federation of Labor. Whatever the theoretical advantages or disadvantages of labor unionism for teachers, it is in the United States to-day a negligible factor so far as its practical significance is concerned.

There is no conclusive evidence that teachers by their efforts in this field are becoming unduly selfish and lowering the tone of the profession. The raising of qualifications for teachers, which comes with practically every economic advantage secured, largely offsets any anticipated disadvantage here.

In all the associations, women, while comprising the great majority of members, have, except in cities, so far exerted little influence. But of late, especially in the National Education Association, which in 1911 had its first woman president, there has been an aggressive movement to secure greater representation for women in the general associations, and in some instances to form separate associations of women. Greater prominence of women in the associations in the future is inevitable and, for the good of the profession, highly desirable. There is no adequate evidence for believing that the dangers ordinarily apprehended in this connection are likely to be more than phenomena of transition until the women become accustomed to assuming the responsibility that their number and prominence in the profession warrant.

The associations undoubtedly accomplish much for the good of the profession and education in general. But comparatively few teachers are active members in any of them, and the profession in this country has never shown the ability to organize and exert its collective strength as in the case of workers in other lines in the United States, and of teachers in European countries. This ability will probably be developed as the teaching profession becomes better established and retains its members longer. But until it does, the accomplishment of many of the practical aims of education cannot be secured.

Great Britain. — In England the general educational associations of the early nineteenth century were much like the old gilds, and the later teachers' associations have been correspondingly affected. This accounts for the fact that teachers' associations in England attend much more to economic betterment and material protection of members than do the corresponding organizations of the United States.

Differentiation and specialization have taken place to a great degree, and there is no division of teachers without its separate organization. The most influential association is the National Union of Teachers (*q.v.*), organized in 1870. This is now an organization of upwards of 70,000 teachers in over 500 local associations throughout England and Wales. It is primarily an elementary teachers' association, but of late other teachers have been admitted.

The associations enroll in active membership a much larger proportion of teachers than do those of the United States, and the organization is much more perfect. Thus the

National Union of Teachers in 1906 was able to declare and virtually carry a strike for the minimum wage scale at West Ham. The associations take an active part in promoting legislation, and it is no uncommon thing for an association to draft an education bill for the consideration of the board of education. The National Union of Teachers finances candidates for Parliament, and for some time its general secretary has been a member and is always consulted upon questions dealing with the teaching profession. The associations devote comparatively little energy to the cultural and professional work attempted by similar organizations in the United States, but they are much superior in promoting the material welfare of teachers. Much of the legislation advocated by them is in this latter direction. They furnish legal advice and protection to members, the National Union of Teachers alone spending about $35,000 annually for this purpose. They also indirectly maintain wage scales, carry on insurance, benevolent, and pension projects, conduct information, appointment and registration bureaus, and maintain extensive publications in a thoroughly effective way. C. A.

Associations for secondary school affairs have been established within the last fifty years. One of the earliest was the Society of Schoolmasters (1798), a purely benevolent and charitable association. One of the most important is the Headmasters' Conference called together by Thring (*q.v.*) of Uppingham in 1869, and launched with a regular constitution in 1891. In 1890 the Association of Headmasters was incorporated. Both associations devote attention to questions of external and internal management of secondary schools and to all professional matters concerning the same. Somewhat similar in scope is the work of the Assistant Masters' Association, which adds to the other work the safeguarding of the professional and economic interests of teachers in secondary schools; valuable work has been done by this association in promoting the professional solidarity of secondary school teachers. The Teachers' Gild (1885) is a comprehensive society including representatives of all types of education; its work is social, benevolent, and educative, a pedagogic library and educational courses being maintained. The interests of elementary education and of elementary school teachers are promoted by the largest of English associations, the National Union of Teachers, founded in 1871, which undertakes political, economic, and educational work. The Incorporated Association of Headmistresses (1874), which played an important part in insuring the progress of the movement for the higher education of girls, and the Association of Assistant Mistresses (1884) perform the same services for the secondary education of girls as the similar organizations for men. The chief educational associations in Scotland are the Educational Institute of Scotland (1847), a general educational institution; the Association of Headmasters of Secondary Schools; the Secondary Education Association of Scotland (1909) for secondary school teachers; and the Scottish Class Teachers' Association, with a membership of 8500. In Ireland the associational activities are represented, among others, by the Schoolmasters' Association (1869) in secondary education, and the Irish National Teachers' Association in elementary. Of the special subject associations the following may be enumerated: Modern Language Association; Geographical Association; Association of Public School Science Masters; Classical Association; Historical Association; School Nature Study Union; English Association; Mathematical Association; Educational Handwork Association. The associations for those engaged in administration are: the Association of Education Committees; the County Councils Association; and the Association of Directors and Secretaries for Education.

Germany. — Associations of elementary school teachers arose in Germany at the beginning of the last century and were intended in the main for professional improvement and general educational advancement. In 1805 there was formed the *Gesellschaft der Freunde des vater ländischen Schul- und Erziehungswesen* (Society of the Friends of the National School and Educational System), followed by the establishment of the Berlin School Society in 1813, known later as the *Berlinischer Schulverein für deutsches Volksschulwesen.* The increase in the number of teachers who had received some kind of training led to a greater professional consciousness, and teachers' assemblies and conferences were held, only to fall under the suspicion of the reactionary authorities. The Revolution of 1848 proved a setback to any attempts at permanent organization, but in the same year the *Allgemeine deutsche Lehrerverein* (General German Teachers' Association) was formed but had to be changed to a biennial conference in 1852 (*Allgemeine deutsche Lehrerversammlung*). Professional matters absorbed the chief attention of these conferences, and the opposition to bureaucratic and clerical control also found voice. To remedy the need of a permanent organization the *Deutsche Lehrerverein* (German Teachers' Association) was formed in 1871, and has continued to be the most important association of its kind in Germany. The *Allgemeine deutsche Lehrerversammlung* was amalgamated with the *Deutsche Lehrerverein* in 1893. In 1906, out of 124,027 teachers in elementary schools 112,768 were members of this association. The *Deutsche Lehrerverein* is undenominational, and aims in the main to promote the progress of public schools and to improve the status, professional and economic, of the teachers. The association supports the *Deutsche Schul-*

museum at Berlin and the *Comeniusstiftung* in Leipzig, collects and publishes statistics, and issues a monthly journal (*Deutsche Schule*) and an annual (*Jahrbuch des deutschen Lehrervereins*). The chief work of the *Verein* is done by the local branches which are to be found throughout Germany wherever a handful of teachers can be brought together for purposes of discussion, etc. The *Deutsche Lehrerverein* has met with some opposition, and two denominational societies have been formed (*Verband deutscher Evangelischer Schul- und Lehrerverein*, and the *Katholischer Lehrerverband Deutschlands*), but without any appreciable effect on the success of the *Deutsche Lehrerverein*. Numerous sectional associations have been formed, but the tendency here is for these to remain within the central association, for it is recognized that its strength lies in its numbers. Hence the *Deutsche Lehrerverein* includes not only branches of general teachers, but also principals' societies and societies of special subject teachers. Parallel with this central association for men is the *Allgemeine deutsche Lehrerinnenverein* (1890) with similar aims and purposes, but distinguished by the fact that it includes teachers from all grades of schools. Recent regulations which discriminate between the training of women teachers for elementary and secondary schools will probably introduce some change. As in the case of the men, the women have also formed denominational associations.

The teachers of secondary schools have been somewhat slower in forming general associations. Such associations as have existed have been usually for research in special fields of study. In 1904, however, the *Vereinverband akademisch gebildeter Lehrer Deutschlands* was formed at Darmstadt; this is a general association of societies of secondary school teachers. The number of members in 1909 was 17,790. The purpose of the *Verband* is to promote the progress of secondary education and to safeguard the interests of teachers in all types of secondary schools. The organ of the association is *Mitteilungen des Vereinverbandes akademisch gebildeter Lehrer Deutschlands.*

The struggle between classicism and realism in higher education, which forms such a large part of recent educational history in Germany, has called forth a number of societies, of which the following are among the most important: (*a*) The *Gymnasialverein*, an organization of adherents of the old classical education, founded in Berlin in 1890. It contains among its members a large number of university professors and even persons not engaged in teaching, but interested in maintaining the classical foundation of higher education. For this purpose the society published a magazine *Das humanistische Gymnasium.* (*b*) The *Allgemeine deutsche Realschulmännerverein* (National Association of *Real* School Men) founded in 1875, which has successfully carried on the fight for the recognition of the modern side of higher education. (*c*) The *Verein zur Förderung des lateinlosen höheren Schulwesens* (Society for the Promotion of Higher Schools without Latin), founded in 1890, with objects similar to the above. The official organ of this society is the *Zeitschrift für lateinlosen höhere Schulen.* I. L. K.

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TEACHING, HYGIENE OF. — When one reflects that in this country alone there are more than half a million teachers, the importance of the hygiene of this occupation is obvious. The hygiene of the teacher differs in many important points from the hygiene of the pupil. Schoolrooms that are quite hygienic for pupils may be in some respects injurious to teachers; for the schoolhouse has usually been built with regard to the health of the child alone. Recently, however, hygienists have begun to study the special conditions that favor the health of the teacher in the schoolroom; and a number of studies of the mortality and morbidity of teachers in different countries have been made; but there are still no adequate statistics. The observation and experience of physicians and the result of a few special investigations indicate that teachers are specially subject to diseases of the throat and respiratory organs, and investigations by Wichmann corroborate common observation that a large percentage suffer from nervous disorders.

A special investigation in this country shows that among the conditions likely to be injurious to the teacher are the following: poor ventilation, poor light, necessity of facing the light, improper heating, chalk dust, outside noise, dust from the street, smoke from factories, etc.; among the harmful conditions of the mental work: correcting many papers, too frequent visitors, overwork, too large classes, a crowded curriculum, teaching one class with another in the room, length of the session, excessive length of lesson periods, etc.; and among the conditions of the physical work involved in teaching: standing, climbing stairs, and the constant use of the voice, the contagion from colds, lack of pure drinking water, uncleanliness of the pupils.

The foundations of ill health in case of teachers seem often to be laid in the normal school and the early years of the teacher's career. Wichmann found that 47 per cent of the cases of nervousness occurred in the first five years after the teacher's examination, and nearly half of these in the first year. A study of normal school conditions in this country indicated that hygiene is largely ignored in the normal schools, and that the students in these schools are apt to suffer from poor ventilation, imperfect heating, the climbing of stairs, an overcrowded curriculum, too little opportunity for leisure, strain upon the eyes, too long a period of daily work, haste, worry, and the like.

Whether it be true, as Moebius suggests, that students of neurotic heredity are drawn into the teacher's calling, or whether they acquire nervousness by the training and the work of the school, the studies already made warrant the following conclusions in regard to hygienic conditions for the teacher.

Care should be taken in arranging school buildings to insure cleanliness, good ventilation, heating, and lighting, without conditions injurious to the teacher; the arrangement of the windows, for example, should not force the teacher to face the light. (See Lighting of Schoolbuilding.) It is necessary to reduce the causes of nervous strain in teaching, especially by a reduction of the number of pupils allotted to each teacher, frequent recesses, reduction of the responsibility for correcting of written work, preparing of records, and the like. The key to improvement in the teacher's health is to be found in the period of normal training; not only should normal schools set an example of hygienic conditions, but the fundamental aim of such training should be the development of permanent habits of health; and young teachers should be trained like soldiers to protect themselves against the inevitable dangers connected with their calling. It is of fundamental importance that personal and school hygiene should be taught; finally, there should be training in mental hygiene in every normal school, and habits of self-control, of orderly association, and of efficient and healthful mental activity should be developed. With the emphasis now placed upon school hygiene, teachers suffering from tuberculosis, nervous disorders, and the like, will not long be admitted to the schoolroom; with the positive aims of modern hygiene, teachers who can set an example of healthful living and normal mental activity will more and more be demanded for the public schools; and it is no longer permissible to build schoolhouses without regard for the conditions favoring the health of the teachers as well as that of the pupils.

W. H. B.

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TEACHING ORDERS OF THE CATHOLIC CHURCH. — The religious orders, congregations, societies, and communities of men and women supply the majority of teachers engaged in the educational work of the Catholic Church. The secular clergy and the laity are also included in the teaching body, as, for example, in the faculties of Catholic universities, seminaries, and colleges, many of which are conducted exclusively by them. The elementary schools, however, and especially those of the United States and other English-speaking countries, are placed largely in the care of the sisterhoods and brotherhoods whose members are prepared for their teaching vocation in the normal institutes or the novitiates of their communities. According to a decree of the Third Plenary Council of Baltimore (1884), such communities have been obliged to establish normal courses in the novitiates unless other satisfactory provision for the professional training of teachers is made.

Since the rise of monasticism (*q.v.*; also Convent Schools), the work of teaching has been one of the chief occupations of the religious orders. In the East and West this educational activity eventually extended beyond the formation of novices or candidates for the order, and included the instruction of the secular clergy and the laity. The Benedictines (*q.v.*) furnish a notable example of this fact in the early Middle Ages. Furthermore, with the orders of women originated the convent schools (*q.v.*) for the education of girls, an institution flourishing extensively to-day. In addition to the older orders, such as the Benedictines, Franciscans, Dominicans, Jesuits, Piarists, Oratorians, etc., which are treated in special articles, a great number of other associations have since arisen whose purposes have been either primarily or secondarily of an educational nature. Those included here are only such as have been recognized by the Catholic Church as orders, congregations, societies, or religious communities of men and women leading a common life, and not such associations as, for instance, the Confraternity of Christian Doctrine, founded in Rome, 1562, composed of religious and lay teachers for the dissemination of Christian truth. In their presentation, under the general division of communities of men and of women, the chronological order is observed.

Communities of Men. — The *Somaschi*, or *Congregation of Somascha*, Italy, founded by St. Jerome Aemiliani in 1532, and so called because of the mother house at Somascha, undertook the management of ecclesiastical seminaries and colleges for the clergy and laity, and at an early date after their foundation established institutions in France and Austria. They eventually extended their sphere so as to include the education and care of orphans and the blind. The Fathers of Christian Doctrine, Doctrinaires, founded 1593, in France, by the Venerable César de Bus, for the work of Christian education, were for a time affiliated with them.

The *Vincentians*, or *Lazarists*, properly called the Congregation of the Mission of St. Vincent de Paul, were founded at Paris, in 1625, by St. Vincent de Paul, for the purpose of conducting missions and charitable works. Education came within their province and they have become identified with the Catholic collegiate and secondary school system in all English-speaking countries, Italy, China, and Turkey in Asia. They have normal colleges in England and Ireland; and in the United States, where they have been established since 1816, they conduct Niagara University, Niagara Falls, N.Y.; De Paul University, Chicago; St. John's College, Brooklyn, N.Y.; Los Angeles College, Los Angeles, Cal.; and Holy Trinity College, Dallas, Texas.

The Sulpicians, Society of Saint Sulpice, founded at Paris, in 1642, by Jean Jacques Olier, a priest, for the training of teachers and directors of ecclesiastical seminaries, has grown into a numerous and potent community. At the time of the suppression of religious orders in France (1900), they controlled there twenty-six large diocesan and provincial seminaries. In Canada, whither they came in 1627, their Grand Seminary, Montreal, is especially notable as the training school of thousands of the Canadian and American clergy. The Sulpicians came to the United States in 1791; they now conduct St. Mary's Seminary, Baltimore; St. Patrick's Seminary, Menlo Park, Cal.; and St. Charles's College, Catonsville, Md. Until recently they conducted the diocesan seminaries of New York and Boston, located respectively at Dunwoodie (Yonkers, N.Y.), and Brighton, Mass.

The Marist Fathers, Society of Mary, a community of priests founded in France about 1816 for missionary purposes, entered shortly after their foundation into the educational field. Before 1903 they had nine colleges, and three diocesan seminaries in France: they now have in the British Isles three colleges; one in New Zealand; and four in the United States.

The Oblates of Mary Immaculate, founded 1816 in France by Charles de Mazenod, afterward Bishop of Marseilles, include priests and brothers leading a common life. The former generally teach in universities and colleges, and the latter in industrial and elementary schools. They conduct the University of Ottawa, Canada; twelve colleges in the United States, and institutions of collegiate grade in South Africa, Asia, and Australia.

The Congregation of the Holy Cross, established 1836, in France, as a result of the union of the Brothers of St. Joseph and the Auxiliary Priests of Le Mans, for missionary and educational purposes, conducts universities, colleges, and secondary schools in Algeria, Canada, and the United States. Their colleges in France were suppressed in 1903. The University of Notre Dame, Notre Dame, Ind., is the mother house of the congregation which is now devoted almost exclusively to educational work. Their colleges are located in Montreal, Quebec; New Brunswick in the Dominion of Canada; and in Oregon, Wisconsin, Ohio, Louisiana and Texas.

The success of the *Brothers of Christian Schools* (*q.v.*), and the increasing needs of the Church called forth many foundations of men not members of the priesthood, who would devote their lives to the education of boys. The Irish Christian Brothers, founded 1802, at Waterford, Ireland, by Edmund Ignatius Rice, a merchant of that city, have grown rapidly and extended their institutions to many of the larger cities of Ireland, especially to Cork, Dublin, and Limerick. In Dublin over 5000 boys attend their primary and secondary schools, and over 1500 are in their orphanages, industrial schools, and institutions for the deaf and dumb. From Ireland the community has spread to England, Gibraltar, India, Australia, where they have now fifty establishments, including colleges, orphanages, and elementary schools. They are established in Newfoundland, and, since 1906, in New York.

The Brothers of Charity, founded about 1810, in Belgium, by the Very Rev. Pierre Triest, of Ghent, aim to care for and instruct orphans, the deaf and dumb, and the blind; to shelter working men; and to alleviate physical suffering and want. In Belgium over 1000 brothers care for more than 9000 children. They have three houses in England, one in Ireland, two in Holland, a reformatory in Montreal, and an industrial school in Boston, Mass.

The Brothers of Mary (The Society of Mary, of Paris) founded 1817, in Bordeaux, France, by Canon William Chaminade, composed of priests and brothers, have for their purpose the furtherance of religious belief by means of Christian education. They have numerous establishments in the various countries of Europe, in China and Japan, Mexico, the Hawaiian Islands, and the United States. They have been in the United States since

1849, and now conduct fifty-three institutions consisting of colleges, industrial and elementary schools, in charge of 400 brothers.

The Marist School Brothers (*Little Brothers of Mary*), founded 1817, in France, by the Venerable Benedict Marcellin Champagnat, are a community of over 6000, laboring throughout the world for the welfare of youth, and especially in the schools. They conduct elementary and industrial schools, homes for working boys, trade schools, etc. In 1903 they had 750 schools in France alone. In 1910 their establishments were enumerated as follows: Spain, 81; Belgium, 41; British Isles, 25; Italy, 16; Turkey in Europe, 9; Switzerland, 3; Bulgaria, Denmark, Greece, and Hungary, 1; Cape Colony, 9; Seychelles Islands, 2; Egypt, 1; New Zealand and Australia, 29; New Caledonia, 6; Fiji Islands, 4; Samoan Islands, 3; New Hebrides, 1; China, 27; Mexico, 25; Cuba, 2; South America, 35; Canada, 29; United States, 12.

The Brothers of Christian Instruction (Lamennais Brothers), were founded 1817, at Saint Brieux, France, by Jean Marie Robert de la Mennais, to meet a necessity not provided for in the rule of the Brothers of Christian Schools, *i.e.* to enable brothers to work singly in small schools. Their foundations are principally in England, where in 1900, after the suppression in France, the mother house was located, in Africa, Asia, Oceanica, and America. In 1903 they numbered 3000 brothers, and operated 420 educational institutions, including boarding schools, trade schools, and orphanages.

The Brothers of the Sacred Heart, founded 1821, by Père André Coindre of Lyons, France, previous to their suppression in France numbered 1100 brothers and controlled 150 schools in that country alone. Besides elementary schools, they also conduct commercial colleges, and in the United States and Canada, where they have been established since 1846 and 1872 respectively, they now administer fifty such institutions.

The Xaverian Brothers, founded 1839, in Belgium, by Theodore Jacob Rycken, are well known in Belgium, England, and the United States for their industrial, agricultural schools, academies, and colleges. In the United States there are 250 brothers of this community conducting institutions in Maryland, Virginia, Pennsylvania, Massachusetts, Connecticut, Kentucky, and Ohio.

Communities of Women. — It has already been noted that the education of women in the Middle Ages was conducted by the religious orders in the convent schools (*q.v.*). Teaching became one of the chief pursuits of such orders as the Benedictines, Franciscans, Dominicans, and the communities which developed from them.

The *Order of Ursulines*, founded 1535, at Brescia, Italy, by St. Angela de Merici, had for its sole purpose the education of girls. The first Ursulines were encouraged and materially aided by St. Charles Borromeo, and they rapidly established themselves in Italy. Their convent schools now flourish throughout Europe, in Africa, and in North and South America. They opened the first convent school in the United States in 1729, and now employ over 1600 teachers in all parts of this country.

The Sisters of Notre Dame, now a numerous religious body in the Catholic Church, were founded 1598, in France, by St. Peter Fourier, for the education of poor girls. They were introduced into America in 1657 with some modifications by Marguerite Bourgeoys, who is venerated as the founder of the Congregation of Notre Dame of Montreal. The latter community conducts elementary and convent schools and colleges in Canada and the United States. They early undertook the preparation of teachers, and at present have a normal school in Montreal; a college in Antigonish, Nova Scotia, affiliated to the University of St. Francis Xavier, and Notre Dame Ladies College, Montreal, affiliated to Laval University.

The School Sisters of Notre Dame, a branch of the congregation founded by St. Peter Fourier, controlled in the seventeenth and eighteenth centuries many convent schools in Germany. They located in America in 1847, at the invitation of the Bishop of Pittsburg, and were in a few years firmly established in the archdioceses of Baltimore and Philadelphia, and in the dioceses of Pittsburg and Buffalo. The American members, nearly 4000, number about one fourth of the entire community. Their institutions include orphanages, schools for the negro, and for the deaf and dumb.

The Sisters of Notre Dame of Namur, so called because of the mother house in Namur, Belgium, were founded 1803, at Amiens, France, by Blessed Julie Billiart, and Marie de Bourdon, Countess of Gezaincourt, for the education of girls and the training of teachers. They came to the United States, locating first at Cincinnati, and in the forties labored among the Indians of the Oregon mission. In 1851 two foundations were made in Central America under the auspices of the government; twenty years later they were exiled from that country. They spread to England about 1845, and now manage there more than twenty institutions including a training college for Catholic schoolmistresses at Mt. Pleasant, Liverpool, the direction of which was granted by the government in 1856. In 1895 at the request of the Scotch education board, they opened the Dowanhill Training College for Catholic Schoolmistresses at Glasgow. In the United States the sisters number over 1200; they conduct Trinity College, Washington, D.C., schools and academies in the archdioceses of

Cincinnati, Baltimore, Philadelphia, Boston, and in the dioceses of Columbus, Peoria, Providence, and Springfield. An outgrowth of this community, the Sisters of Notre Dame of Cleveland, has nearly 500 members.

The English Ladies, founded 1609, in France, by Mary Ward, and suppressed by the Church in 1630, was succeeded by the *Institute of Mary*, established at Munich, Bavaria, for the maintenance of convent schools and the care of orphans. In the seventeenth century their houses flourished throughout Bavaria, Italy, France, and England, and they were known as the Englische Fraülein, Dame Inglese, etc., in those countries. They spread also to Austria, India, and Ireland. In the latter place they are called the Loretto Nuns, from the shrine at the mother house, Rathfarnham, where in 1821 the first community was instituted by Frances Ball. The Loretto Nuns have ten establishments in Australia, with a central training college for teachers at Melbourne; three in Spain; eight in Canada, and three in the United States. From them are to be distinguished the Sisters of Loretto at the Foot of the Cross, a community founded 1812, in Kentucky, by Father Charles Nerinckx, and incorporated by an act of the State Legislature, 1829, as the "Loretto Literary and Benevolent Association," which began educational work in the pioneer settlements and among the Indians of Kentucky and Missouri. They now constitute a community of 650 sisters with schools in the archdioceses of St. Louis and Sante Fé, and the dioceses of Cleveland, Mobile, Bellville, Kansas City, Lincoln, Denver, Tucson, and Dallas.

Visitation Nuns, Visitandines, founded 1610, in France, by St. Jane Frances de Chantal and St. Francis de Sales, undertook among its earliest works the education of girls. The order has now over 7000 sisters and 165 institutions in all of the countries of Europe, in Syria, and in America. Georgetown Visitation Convent, Washington, D.C., was established in 1799, the first of the 21 convents now operated by the Visitandines, who number over 800 in the United States.

Presentation Sisters. — The earliest sisters of this name were the Daughters of the Presentation, founded 1627, by Nicholas Sanguin, Bishop of Senlis, France, for the education of poor girls, but they did not survive the French Revolution. The Sisters of the Presentation of the Blessed Virgin, founded 1684, by the Venerable Marie Poussepin, at Sainville, France, for the work of teaching and the care of the sick, became widely established in France, Spain, South America, and Turkey in Asia. The Order of the Presentation, founded 1775 at Cork, Ireland, by Miss Nano Nagle, was raised to the status of an order in 1800. It spread from Cork to Dublin and Limerick, and has now in these cities over 3000 pupils. Domestic economy and the industrial arts are especially taught by these sisters. They went to Newfoundland in 1829, and now have there 14 houses. They located in England in 1833; India in 1841; Australia in 1873; and the United States in 1854, where they now have over 400 members teaching in academies and elementary schools. Sisters of the Presentation of Mary, founded 1796, in France, by the Venerable Marie Rivier, came to the New World in 1853. They number nearly 500 in Canada, and have their mother house at St. Hyacinthe, Quebec.

The Sisters of Charity of St. Vincent de Paul, founded 1633, in Paris, by St. Vincent de Paul, for charitable works, spread with the congregation of priests of the same title throughout Europe and Asia, and engaged in the education of the poor. They are called by the Orientals "The Swallows of Allah," from their cornettes. Among their foundations in Great Britain are 23 orphanages, 7 industrial and 24 elementary schools. Mother Eliza Ann Seton inaugurated the congregation in the United States by opening a convent at Emmitsburg, Md., in 1809. The sisters teach in academies and parish schools. A branch of this community located in New York City in 1817, and in the early thirties and forties opened academies for young ladies. Their mother house is at Mount Saint Vincent-on-the-Hudson, and there also is the college of the same name. From this community now numbering 1400 sisters, with one college, 15 academies, and 85 elementary schools, has sprung another of the same name with a mother house at Convent Station, New Jersey. The latter has 1150 members, and conducts 1 college, 6 academies, and 80 elementary schools. The Sisters of Charity of Hamilton, Ohio, number about 800 and do similar work in the Central and Western States. The Sisters of Charity of the Blessed Virgin Mary, founded 1831, at Dublin, Ireland, and introduced in the United States in 1833, are now a flourishing community of 1100 members devoted exclusively to education, with mother house at Dubuque, Iowa.

Sisters of Charity, Grey Nuns, founded 1738, in Montreal, by Madame D'Youville and Rev. Louis M. Normand, for the education of girls, are a community consisting of 1100 members in Canada and the United States. From them were founded in 1845 the Grey Nuns of the Cross, with mother house in Ottawa, who conduct academies and elementary schools in Canada and the United States. They have also schools for Indian children in Canada. D'Youville College, Buffalo, N.Y., is under their jurisdiction.

Sisters of Christian Charity, founded 1849, at Paderborn, Germany, by Pauline von Mallinckrodt, although exiled from Germany by the persecution of the Kulturkampf are again well established there. They have numerous houses in North and South America.

In the United States 720 teachers of this community are engaged in elementary education.

Sisters of Providence. — A number of sisterhoods are known by this title. The Daughters of Providence, founded 1643, at Paris, by Madame Polaillon, were at first organized for the education and protection of young girls. They eventually devoted themselves to elementary education, the management of orphanages, and institutions for the blind and the deaf and dumb. Before the Separation Law of 1903 they numbered over 10,000 in France. The Sisters of Providence of St. Mary's of the Woods, Vigo County, Indiana, founded 1806, in France, with the instruction of youth as their primary object, came to America in 1840. In 1841 they opened a boarding school at St. Mary's of the Woods, near Terre Haute, which was chartered by the State in 1846 and empowered to confer collegiate degrees. In 1911 these sisters numbered nearly 1000 and conducted 68 parish schools and 15 academies. Other Sisters of Providence devoted to education are, the Sisters of Providence of Charity, of St. Ann, of the Institute of Charity (Rosminians). The latter, founded in 1843, have houses in Italy, England, and Wales. In 1843 they opened one of the earliest day schools for poor girls in England. There are also distinct communities of Sisters of Providence in Texas and Kentucky.

The Sisters of St. Joseph were founded 1650, at Le Puy, France, by Rev. Jean Paul Medaille, S.J., for the education of children, with a rule based on that of St. Ignatius. They suffered greatly during the French Revolution. Today they are to be found in Asia, Africa, many countries of Europe, and various dioceses of the United States. In 1910 their four provinces in the United States, viz.: St. Louis, St. Paul, Troy, and Los Angeles, contained over 1800 sisters, and 125 educational institutions, with an attendance of 40,000 pupils. The Sisters of St. Joseph of Chambéry, France, also have schools in England, India, and the United States.

The Sisters of Mercy. — The *Borromean Sisters*, or properly called the *Sisters of Mercy of St. Charles Borromeo*, founded 1652, at Nancy, France, under the especial patronage of St. Charles Borromeo, manage charitable institutions, trade schools, protectories, and other schools in France, Austria, Germany, Egypt, and Palestine. The Sisters of Mercy best known to English-speaking countries are a congregation founded 1827, in Dublin, Ireland, by Catherine Elizabeth McAuley and designed to instruct the poor, to visit the sick, and to perform any other work of mercy. In 1838 they located in England; in 1842 in Newfoundland; 1843 in the United States, and more recently in South America, Mexico, and the West Indies. In the United States they number nearly 5000 teachers.

The Religious of the Sacred Heart, founded 1800, in France, by the Venerable Madame Madeleine Sophie Barat, planned to do for the education of girls what the Jesuits had done in that respect for boys. Their rule is founded on that of St. Ignatius; their institutions are widely established in Europe, Algiers, North and South America. A uniform course of study was adopted for the community in 1820. In the United States since 1818, these sisters have developed into a teaching body of over 1000, with three provinces in New York, St. Louis, and Chicago, administering 25 academies and 13 parish schools.

The Religious of Jesus Mary, a congregation founded 1818, at Lyons, France, by Claudine Thevenet, to educate girls and to afford residences for ladies of the literary profession. Before expulsion (1901) their houses were located at Le Puy, Rodez, and Remiremont, France. They conduct the Stella Viæ College, Rome; 12 institutions in India; boarding schools in Spain, Mexico, Yucatan, Canada, and the United States; and "Our Lady of Peace," for literary women in New York City.

Sisters of the Holy Names of Jesus and Mary, (Sisters of the Holy Names), founded 1826, at Marseilles, France, and with some modifications in 1844 at Quebec, for the education of young girls. Their mother house is at Montreal. As early as 1859 they were located in Oregon City, Oregon, and shortly afterward in Seattle, Washington. These two states now form one of the nine provinces governed by Canada. Their academy and college, (St. Mary's), Portland, Ore., were empowered in 1893 to confer degrees and grant teachers' state certificates and diplomas, and their other academies at Seattle and Spokane have been since 1907 accredited as state normal schools. The congregation numbers over 1300 sisters and novices, and conducts 99 schools, of which 48 are in the United States.

Sisters of the Holy Cross, whose mother house is at Notre Dame, Indiana, were founded 1841, at Le Mans, France, by Rev. Basil Moreau. They came to the United States in 1843, and among their other activities assisted in the Indian missions of Michigan. By 1850 they were established in New York, Louisiana, and Pennsylvania. In 1869 the American branch separated from the French, and they now constitute a community of 1000, conducting 60 educational institutions, of which two are of normal and one of collegiate grade.

There are in the Catholic Church numerous other communities, especially of women, devoted to special phases of educational work, as, for example, the *Sisters of the Good Shepherd*, for the moral reformation of wayward girls; the *Sisters of the Blessed Sacrament*, an American community for the education of the Indian and Negro; the *Blind Sisters of St. Paul*, for the instruction of the blind. It is impossible to enumerate all in a brief article. P. J. M.

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TEACHING, PRINCIPLES OF. — Those principles of educational practice which have a general applicability to all the educative processes employed by the teacher are called the "principles of teaching." Taken together as a systematic theory, the principles of teaching method constitute a field of theory coordinate with the "principles of administrative method," both of which are subordinate to the "principles of education" (*q.v.*), which give an organized presentation of the fundamental assumptions, relations, and generalizations underlying both teaching and administration.

The principles of teaching presented in a related series comprise a complete systematic theory of an educative process under the stimulation and control of the teacher. Each principle is an abstraction of some fundamental characteristic of effective procedure presented in a form to suggest an important application of the laws of mental activity and growth. Such principles of the teaching process are supplementary to one another, usually overlapping; thus the principle of "interest" suggests many psychological elements basic in the principle of "self-activity." However, both statements are essential because they view the educative situation from somewhat different logical or psychological viewpoints, and emphasize different elements or sequences within the teaching process. The more familiar principles or doctrines referring to teaching technique (*e.g.* "sense-perception," "self-activity," "interest," "apperception," "correlation," "culture-epochs," "no impression without expression") have, at least in the special emphases of their statements, been the product of educational controversy and reform; hence the elements abstracted and emphasized by these historic principles have been largely determined by existing neglects. Thus teaching exclusively from linguistic symbols led to an emphasis upon sense-experience as the basis of learning; the passive attitude of the pupil to a demand for constructive activity; a formal authoritative teaching to an increased acceptance of the doctrine of interest. Taken together, these conspicuous principles, so well known to the profession, do not give a well balanced theory of the teaching function; they represent selections and emphasis developed by the historic quarrels of the profession, hence the scientific discussious of the modern textbooks in pedagogy are characterized by a different choice and order of principles, sometimes to the complete exclusion of many of the traditional terms. Inasmuch as the whole theory of the teaching process is implied in any discussion of the principles of teaching method, only the more important elements abstracted by the modern pedagogical theorist may be mentioned here.

Aims. — The ultimate function of the teaching process is social. Every method of instruction refers for its sanction to the conditions of life external to the school. The values which interpret the activities of the child and give worth to teaching technique reflect the actual and ideal demands of social organization. The schoolmaster has attempted to organize these aims and values under terms of varying scope and emphasis. A few of the more important are: (1) knowledge, (2) discipline, (3) culture, (4) skill, (5) utility, (6) morality, (7) social efficiency, (8) service, (9) natural development, (10) harmonious development, (11) happiness, (12) natural welfare, (13) adjustment to environment. (See Course of Study, Theory of the; Values, Educational.)

Interest. — The fundamental determinant of the teaching process is the unfolding nature of the child. His interests and powers determine what his training may be. There is no education without attention, and no fullness of attention without interest. The interests of the child are all fundamentally based on instincts; all derived interests have an instinctive basis. Only in so far as the teacher studies the natures of growing children can he stimulate and control their activities. The child is the chief conditioning factor in the teaching process. To ignore or coerce the child is to deaden his responsiveness, and to limit the range and the depth of the teacher's educative control. To be superficial in the interpretation of his interests and needs is merely to waste the teacher's energies by applying them to what is temporary rather than permanent in human nature. To recognize stable interests as the basis of the teaching process is to guarantee absorption in the work at hand and a full and ready expenditure of the child's energy. To exchange effort for interest as a symptom of what is desirable is to perpetuate divided interests, inner conflict, and other manifestations of maladjustment in mental activity. The beginning of all good teaching is to be found in the spontaneous need of the child to express his own nature and to solve the problems of his own social situation. (See Interest; Motive; Self-activity.)

Expression. — If the child's need to express himself is the foundation of the learning process, the teacher is bound to use expression as one of the chief modes of learning. Normally the child learns by doing. The teacher gives the child his first opportunity to learn, not by repressing him, but by permitting him to express himself. Any crudity in results reveals the child's lack of effective technique, and he begins the process of learning the situation intellectually so he may modify his behavior. Thus expression normally comes before deliberate learning — before conscious impression. And conscious learning is best motivated when action has been tried out and found wanting. Thus expression is necessary both as an introduction and as a conclusion to thought. Thought is therefore motor in both its origins and its references. It is not enough to say " no impression without an appropriate expression "; all conscious impression must likewise be preceded by expression. The principle of expression is broader in its demands than mere application or verification of ideas.

Motivation. — It is apparent that all motivation in effective teaching has an original reference to instinct, interest, or other form of personal need and a secondary reference to the need of active ways and means for ministering to desire. Thus the first need to satisfy desire may be supplanted in the consciousness of the child by the desired need to act. In turn, consciousness may be taken off a mode of action that is inadequate and focused on an intellectual understanding of the case. But the motive for studying the situation lies close to the action needed. That the teacher sees the connection between an assigned task and necessary knowledge does not give any psychological assistance to the pupil. The child himself must feel that the cognition of facts is related to his own need to act. Again, before the child can learn the facts (facts out of his observation or the teacher's telling or showing), he must learn to read, to master symbols. Thus the bridge between original impulse and final action may be widened, the focus of consciousness passing from desire to action, to cognition, to symbols (the conventional instruments of comprehension). The danger is that the teacher will hold the child suspended in one of these intermediate states (learning the alphabet, mastering diacritics and phonetics, acquiring information, etc.), so that since he is deprived of the right to refer his activities back to the original needs which reënforce interest, his learning and doing at once become mechanical processes. The intermediation between desire and action must be short with young children; it may be long with adults. A child may grow into the adult's way of thinking only by a very gradual lengthening of the intellectual intermediation between desire and deed. This increased intermediation of the cognitive aspect of consciousness, constantly conditioned by repressed desire and delayed action, is made possible only as the child slowly acquires new, desirable interests, emotions, or sentiments (themselves a product of previous action and rightly motivated thought) and as he grows in the power to hold in mind at once many intellectual situations and references. (See Activity; Emotion; Interest; Motive; Motor Processes.)

Concentration. — The need to act in order to satisfy needs is the chief factor in any normal organization of mental life. The overt activities of the child, whether constructive or merely expressive, are the basis of unity in the child's life. He selects information and gives an order and relationship to facts as the practical exigencies of his own social life dictate. The center of the school curriculum is not in any subject (geography, history, science, or literature), but in the child's active needs. Out of his needs he gathers intelligence from every quarter; facts gathered to meet real necessities are readily correlated by his use of them. He has no sense of crossing academic boundaries between geography, history, reading, etc. His knowledge is differentiated into special aspects (studies or subjects) only as continued accumulation and comparison of facts finally suggest the economy of such classification (nature study, geography, physical geography, political geography, etc). If he ceases to become conscious of certain types of skill because they have become matters of habit, it is because efficient action on his part no longer requires the consciousness of them as special emphases or school subjects (penmanship, spelling, phonetic reading, etc.). (See Concentration; Coördination; Correlation; Differentiation of Studies; Unity.)

Apperception. — The need to perceive his own situation is essential to a child the moment his capacity for action fails him. He does not normally first observe his situation and then interpret it. Selective attention operates the moment he observes one thing as opposed to another. The selection has been determined by his mental constitution, his experiences, and his existing systems of thought, all of which have given his mind a " set " in one particular direction or another. The situation is not essentially different when the teacher intervenes, selecting experiences to be shown the child by demonstration or told him in words. The pupil's nature, his experience, and his mental make-up determine what the teacher should select for presentation to the child, in order that attention and understanding ensue. What the child can learn depends upon his previous knowledge. The teacher must constantly refer to the assimilative power of the child's equipment to select the experiences, the presentation of which is to be educative. This normal law of the perceptive process of the mind, when restated as a principle for the teacher's control of the learning process is termed the principle of apperception. (See Apperception; Perception; Correlation.) H. S.

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TEACHING, PROFESSION OF. — Teaching as a vocation has been regarded as one of the four traditional professions. It shares this accepted position along with the practice of law, theology, and medicine. Owing to the great number of persons employed in public school teaching, the wide territory over which they are scattered, the inadequate preparation of many of them, and the short period of service characteristic of the professional life of the teacher, it has been difficult to develop and maintain a thoroughly well-organized professional consciousness, expressing itself in the recognition of a definite series of professional ideals and an explicit code of professional ethics.

There are certain marked characteristics of professional practice applicable to teaching which are attaining an increasing recognition. (1) There is a widespread belief that one of the fundamental conditions of professional service is found in the changing nature of educational problems. The chief work of the teacher is to adjust to a constantly changing and growing human nature, as that of the educational administrator is to meet the needs of a continually evolving social life. The focus of the educator's attention must be upon the varying elements of his situation, and the practice of the profession must in consequence be characteristically progressive rather than traditional; thoughtful rather than habitual. To become mechanical in the school system is at once to cease to be professional. The essence of professional practice lies in its artful concrete adjustments to constantly varying situations, problems or crises requiring the invention of new technique or the modification of old methods.

This principle gives special sanction to that current opinion which opposes a system of preparing educators to teach or supervise merely through the skill acquired by practical apprenticeship. The required flexibility demands a broader training in the basal subjects which interpret educational factors, and in the philosophy of education which emphasizes fundamental assumptions, relations, and principles.

(2) Such an interpretation of the educational function demands that the teacher be given a preliminary equipment which will guarantee resourcefulness adequate to meet the constant series of unsolved pedagogical and sociological problems inherent in educational work. Because the teaching group is specially charged with responsibility, its resourcefulness must be of a kind superior to that of laymen; it must express itself in expert knowledge and skills. This second professional ideal involves the standard that all educational work is an expert service. In the case of the ordinary classroom teacher the demand is for four things: (1) scholarship, (2) pedagogical technique, (3) social values, and (4) personality. The teacher does not deal merely with knowledge or truth; he deals with the personal and social values of truth. The teacher must therefore add to adequate scholarship superior social attitudes and ideals. As the former is transmitted by the conscious pedagogical technique the latter is transmitted chiefly through the unconscious methods of personal influence. Hence in the practical work of selecting and appointing teachers the expert qualities demanded are more numerous and specific than ordinary courses of training and certification examinations would seem to indicate.

(3) Professional service is to be distinguished from non-professional employment in more than the varying conditions of its work and the wide expert resourcefulness required. It has a social significance not attained by other kinds of work, which requires that its service be performed with a consciousness that focuses on social welfare rather than on personal profit. Entrance into a profession is entrance into a specific servantship, where the ends of society are dominant. To commercialize law, medicine, theology, or teaching is simply to serve selfish rather than social ends. There may be a large personal return, but it is subordinate in consciousness to the satisfaction of service rendered. The sanction for this third professional ideal is found in the large effect of good or bad teaching. Teachers do more than earn or fail to earn their personal livings; they incidentally and inevitably affect large or fundamental matters such as the state of civilization, the morality of a generation, or the social potentialities of the individuals taught. Hence, there is a prevalent social suspicion of teachers' organizations which make an economic return the chief bond of union. On the other hand, free sanction is given to voluntary or other associations of teachers which make the improvement of professional service the chief end, even though the secondary efforts of such organizations are to provide pensions, adequate tenure, and better salaries.

(4) The final condition of all professional service is that it must be performed in a human medium, where human personalities are to be reverenced as ends as well as utilized as means. All professional service is characterized by the fact that the human element is present in such degree as to require special ethical conventions for the control of the conduct of the case. This is to guarantee

that no important human rights shall be violated, and to guarantee a more effective positive professional coöperation. It follows that all well-developed professions have an accepted and effective code of professional ethics determining the relations of the practitioner to each body of human beings involved in his practice.

Professional Ethics. — Though a number of local teachers' organizations in the United States have formulated statements of professional ideals and codes of professional ethics (*e.g.* code of ethics of the Illinois Town and City Superintendents) there is for American teachers as a whole, nothing similar to the "Principles of medical ethics" of the American Medical Association, or the "Principles of professional practice and the canons of ethics" formulated by the American Institute of Architects. There are, however, certain basic principles which are gradually acquiring a wide if not a general acceptance among American teachers. The following are among the most important of these: —

It is the positive professional obligation of every teacher (1) to coöperate with all educational officials on all measures designed for the establishment and maintenance of high standards of professional preparation and service. (2) To assist in preserving the prerogatives of expert educational officials which are designed to safeguard (*a*) the selection, elimination, promotion, demotion, and assignment of teachers, (*b*) the formulation and execution of the course of study, (*c*) the choice of textbooks and other professional school aids and supplies, and (*d*) other expert educational functions. (3) To regard the chief professional official of the particular administrative system as the proper medium of communication between the teachers and the board, or between the board and book houses, supply houses, and others interested in the schools from a commercial standpoint.

It is unprofessional for a teacher (1) to apply for a position which is not vacant, (2) to offer any argument or exert any influence toward his appointment to a position other than that of professional fitness, (3) to accept a position during the contractual period of an appointment without giving knowledge of interest and intention to the superintendent and board of education, (4) to enter into any obligation, financial or otherwise, which would interfere with his freedom to exercise his best expert judgment in all matters touching professional efficiency. H. S.

TEACHING THROUGH VERSIFICATION. — See Versification, Teaching By.

TEACHING, TYPES OF. — The theory of the teaching process is currently discussed in two ways; either (1) in terms of the principles of teaching, or (2) in terms of the various types of concrete method. A principle of teaching is always a rule of procedure based upon some generalized aspect; it does not usually take into account the other principles that will be actively involved the moment an attempt is made to apply the single principle under consideration. A type of teaching method, on the other hand, always deals with a complex of applied principles; it is an actual operation wherein all the necessary principles are actively imbedded. Here one type is differentiated from another because of some dominant characteristic. This differentiating character is not necessarily some dominating principle of teaching applied in the method. It may be of various sorts. Sometimes it is a principle, as in the inductive lesson, again, it may be the material used (objective lesson), or the chief function (assignment lesson), or the mode of communication used (oral lesson), etc.

Each type of teaching represents some specialization in method, and like all specialized devices acquires certain limitations along with its advantages. For this reason no special method has a valid universal application. Each has a local application of high value, but requires in any considerable teaching span to be supplemented by other teaching types. Sometimes a single type of teaching movement or lesson may extend over several class periods (as when an examination or laboratory demonstration is continued over several days), or, as is more usually the case, a number of types of teaching occur in rapid succession within a single class exercise (as the spelling period devoted to word study may give the following succession: recitation, assignment, study, practice, examination, assignment). (See Recitation, Method of.)

There are a number of conditioning factors in every teaching process. There is the child at one end of the situation and society at the other. And for the purpose of bringing these two terminal factors into integral relation, there are certain intermediating factors, the experiences potential in the course of study and the teacher who is to control them. Usually, though not always, types of teaching are classified from the standpoint of these two intermediating factors. One teaching method differs from another because the chief experience in one case is with sense experiences (object lesson), and in another with generalizations (inductive lesson). Again two methods differ because the teacher's immediate purposes vary. Sometimes he wishes to test knowledge (examination lesson), and again, to develop it (development lesson), and still later to fix it (drill lesson). Naturally these classifications overlap (*e.g.* objective, inductive, and deductive development lessons). Often the medium of experience is taken as a basis (object, oral, or written lessons). But a differentiation of types (1) in terms of difference of the dominant type of experience, and (2) in terms of the difference of the teacher's proximate purposes, offers a convenient classification for the discussion of the various types of teaching now in common use.

Expression. — In the beginning children learn chiefly by doing things, or by expressing themselves. It is the most natural method of tuition. To respond with bodily movement is highly instinctive, and even those responses which seem to have no overt qualities are accompanied by motor attitudes, or incipient actions. In consequence, expressive methods have a dominant place in teaching young children, particularly in the early mastery of unfamiliar situations. Such a theory would give plays and games, dramatization, manual construction, drawing, painting, and modeling a large place in the kindergarten and primary grades. The subjects which provide opportunity for learning through expression or doing ought therefore to be favored. The important thing is to arouse expression by stimulating the real interests of children, those that arise out of their own personal and social life. Fullness of expression requires fullness of interest. The danger of the school is that it will too early call for restricted and narrow types of motor responses, the smaller movements of throat and mouth, hand and eye. Again the range of expressive opportunities in school life is too narrow. It is now chiefly verbal, whereas it should give every possible outlet from dancing to song, manual work to sociable play. Too frequently one type of response is demanded and encouraged when another is really more efficient for learning. Thus it is better to map out a location than to describe it in words. The appropriate expression will generally show up defective knowledge, for it is a mode of testing knowledge as well as obtaining it. Expression aids in giving organization to knowledge by eliminating unneeded facts, subordinating less essential ones, and relating and ordering knowledge in the form required for effective action. (See Action Work; Expression; Motor Education; Motor Processes.)

Practice. — The expressive type of teaching has an additonal worth in that it gives the child his first command over the technique of action. The child's action may fail because his knowledge or technical skill falls short of his need. He must focus attention on the acquisition of the skill necessary to satisfy his situation. This involves the use of the practice activity. Here the teaching of form is merely preliminary and incidental to teaching execution. Having given the pupil a clear controlling image or model as to what is to be done, so that he can select his successful activities by some definite standard, the teacher must then guarantee an interested repetition. The teacher should do everything possible to add to the child's satisfaction when he improves or achieves his result. Praise and other social satisfactions should reënforce the more primitively natural ones. Care must be exercised not to be overtechnical; that is, to require the child to master more techniques and skills than he sees any use for in accomplishing his ends. This is the characteristic error of the teacher dealing with penmanship, drawing, and manual construction. He demands a perfection of execution which he does not take the trouble to make the child desire; instead he imposes the standard, the child loses interest, and the work becomes wasteful. (See Drill; Habit; Writing.)

Objectification. — But the failure of the child in action or expression may be more fundamental than a mere lack of technical skill or executive power. He may lack an appreciation of the conditions under which he is trying to act. The school must therefore provide adequate intellectual appreciation of the circumstances in hand. The appreciation needed may be of various sorts, extending from a clear knowledge of realities (represented by clear images, concepts, generalizations, and relations) to a comprehension of modes of intellectual procedure. If the comprehension is to be given chiefly through a sense perception that is to give clear images, we have the objective type of teaching. This includes the object lessons and observations of the lowest grades, school excursions, laboratory experiments, demonstration work, and map, model, graph, and picture work. In fact, all work with objects, whether merely observed or actively handled, is to be included under objective teaching. Objective teaching should be a method of fundamental and wide use with little children. Active observation, that is, the gaining of clear images under conditions of actual manipulation of things, should be particularly stressed. But the correlation of active expressive work and objectification is not merely with youth; it has a more exact placing if associated with new aspects of experience. Relatively speaking, the child is young to the subject if it is new and strange to him. Again, it must not be assumed that an aimless looking at things is good objectification. Attention is selective; and purpose and interest must be present in all objective work to provide the basis for proper selection and organization. The objective method of teaching finds its largest application in the natural sciences, but its use may be considerably extended in the humanistic studies which tend toward abstract and verbal treatment. (See Object Teaching; Visual Aids; also Excursions; Experimentation; Laboratory.)

Induction. — The understanding prerequisite to action may be that of summarizing laws, similarities embracing many experiences. The attempt to teach a child general truths from particular facts is an inductive type of teaching. The basis of such an activity may be in active experiences with things, or with mere observations; again it may be with abstract qualities and with laws of less wide applicability than the wider truth one seeks. Its movement is across the whole cognitive domain wherever one passes from data to interpretation, whether the desired product be an idea, concept, relationship, abstraction, principle, or judgment. Like objective work, it has a relatively larger use in the natural sciences than in the humanities, but the appeal to data as a means of arriving at conclusions is of large importance in history, civics, etc., where the very complexity of the field and the existence of human prejudices, personal, traditional, and conventional, obscure sound conclusions.

In using inductive methods of teaching, several principles suggest the appropriate procedure: (1) make the problem to be investigated perfectly clear; (2) provide enough concrete facts so that the essential element is repeated with sufficient frequency to be impressed, and the concomitant elements sufficiently varied so that no one of them will be remembered; (3) aid the child to emphasize the likenesses by making the common elements as obtrusive as possible and by contrasting the unlikenesses, (4) get the child to formulate his conclusions as a tentative judgment, attaching the appropriate word or phrase to assist in retention; (5) have him verify the conclusion by testing it with additional particular cases. These suggestions on the method of inductive teaching have been given formal pedagogical statement by the followers of Herbart, who have stated them as the "five formal steps of the recitation." (See RECITATION, METHOD OF; STEPS, FIVE FORMAL.) These five suggestions or stages of (1) preparation, (2) presentation, (3) comparison and abstraction, (4) generalization, and (5) application, correspond in a general way to the hints offered above.

Teaching by types is an abbreviation of inductive teaching, where the chief shortening of the process is made in the presentation of data. Instead of a wide and variable series of pertinent data being used, a single case may be made the subject of study. The case selected must, however, be a highly representative one, and the teacher's control must be increased in order that the analysis of elements may be made so as to obscure the irrelevant and emphasize the characteristic factors. The stage of illustration, verification, or application must usually be extended to make sure the generalization of the type has been accurately grasped. Teaching by types is usually employed: (1) where it is impossible or inconvenient to use many particular cases, or (2) where the children are old enough to be well schooled in a full inductive method and are capable of comprehending that the type is representative of wider data, or (3) where there is a large need to economize time.

Inductive teaching has been given a very extended use by the educational reformer. It has in consequence been held to have a wider application than is the case. It has usurped the place of other modes of teaching more efficient in dealing with habit formation, emotional appreciation, etc. Often the method is abused. It is made a form of instruction through which the teacher passes information, rather than a mode of the pupil's experience and thought. Sometimes it has been required of children when they have not and cannot get the data requisite to generalize for themselves. (See INDUCTION; TYPE STUDY; also GEOGRAPHY, section on **Methods of Teaching.**)

Deduction. — The pupil's lack may not be of knowledge to be derived objectively or inductively. He may have his concrete case or problem very definitely in mind; he may have possession of all the laws or principles which have a bearing on his difficulty; but he doesn't know precisely which of the various principles now in mind apply or do not apply to the case in hand. His need is to relate principles and concrete difficulty. He wishes to know which particular principles apply to his unsolved concrete situation. The problem may arise directly out of the need to act on a given difficulty. Or it may appear in the form of an intellectual curiosity incited by an experience which calls for explanation. Again, it may be that one must prepare himself for action by making out a plan or policy that will be valid because the significance of the fact can be interpreted in advance. In deductive teaching, the important things are (1) to have a clear comprehension of the chief elements in the problem to be solved; (2) to examine each of the principles which the data call to mind, estimating them by their relation to the elements of the problem; (3) when the pupil has identified his case with his principle, to get him to formulate his tentative inference; and (4) to influence the child to check up his inference by other knowledge which he already has or may obtain from people and texts. The four suggestions here given have sometimes been called the steps of the deductive lesson.

As teaching by types is an abbreviated inductive method, so teaching by topics is a shortened deductive mode of teaching. As the presentation of the type is a ready-made summary of the logically necessary data, so an outline of topics is a ready-made summary of the relations between topics and subtopics. And once more the shortened stage of thought must be compensated for by extended verification. The child grasps the meaning of each major topic and minor topic to assure himself that the relation suggested is correct. The danger is that the child will merely commit the facts and memorize the order without actually seeing the relation between a concrete case and the more general concept or movement which includes it.

The deductive mode of instruction is chiefly valuable for practical situations where quick response is necessary. The inductive method is slow, the method of inference rapid. In physical or moral circumstances where unquestioned laws or standards are involved, the deductive mode is highly efficient. Children will give more ready responses in deductive teaching, but they will also more often guess. Not the inference, but the verification, must be stressed to make the deductive process of teaching really thoughtful. In the natural sciences young children should be taught objectively and inductively more often than deductively, because they lack the experiences and principles necessary for deductive thought. As they grow older, more particularly as they become more experienced with a subject, they ought to make a larger use of deduction. Thus deductive teaching is much used in history, geography, and other subjects where many principles and limited data are available. In the natural sciences, mathematics, say, it becomes of increasing prominence as the elementary facts and minor principles are mastered. (See INDUCTION; TOPICAL METHOD.)

Formal Association. — In all the foregoing discussion of types of teaching, it has been implied that learning has been accomplished through some mode of direct experience, that is, through action and observation, and reflection upon the same. But while this direct mode of learning (indirect method of teaching) is fundamental, it is not the final or the dominant mode of getting experiences at school. The school child obtains most of his experiences vicariously, *i.e.* from others through the medium of verbal communication. He is told things (oral method) or he reads about them (textbook method). But before he is capable of being taught directly by the teacher, who attempts to transmit ideas, principles, etc., to him, he must master the conventionalities of language; he must understand the formal linguistic symbols, so that words (spoken or printed) mean something to him. The oral symbols are gotten readily enough since speech tends to be associated with all the child's normal social activities with things and affairs. He cannot easily detect the experiential associates of the written or printed symbol. Parent or teacher must go out of his way to give the child the meaning of these forms. Thus, just because life does not provide for incidental instruction in these formal associations between printed symbols and meanings, the school was established. This accident of the school's establishment has made formal instruction traditionally the first and main function of the primary grades. In consequence, formal instruction has been taken out of its normal setting among other experiences. In consequence, formal instruction has tended to teach a symbol, manner, or practice out of relation to function and need. The whole reform movement in modern education has been a prolonged attempt to restore the formal subjects (reading, writing, spelling, and arithmetic) and formal instruction to their appropriate relationship with things and actions in the real world. The formal subjects, in fact, are no longer "formal" in the traditional sense; they are full of content, *i.e.* associated meanings. Primarily formal instruction is an effort to perfect an association among (1) an experience or meaning, (2) an oral or spoken symbol, and (3) a printed or written symbol. The laws of mental association are therefore the basis of the principles that control the formal lesson. The factors usually given for efficient recall of associations are: (1) primacy of impression, (2) intensity, (3) frequency, (4) recency, and, (5) degree of satisfaction ensuing on the formation of the association or its recall. These laws of association suggest the following principles of teaching: (1) see that the first impressions and associations are the desired ones, (2) see that the perception of the association and its recall are motivated by some real need that will insure focal attention; (3) repeat the experiences as often as efficient interest can be maintained in the drill of the recall; (4) apply the facts often enough by way of review to guarantee the permanency of the association; (5) make success and failure in recall significant to the child.

The current errors in formal instruction are: (1) not to guarantee adequate motive for acquiring the form, (2) failure to assure its connection with real meanings, and (3) the danger of omitting some of the associates needed to make the appreciation and use of the form completely efficient. (See READING, TEACHING BEGINNERS; SPELLING, TEACHING OF.)

Study. — The teacher is interested that the child shall get something more than sense experiences, generalizations, correct inferences, and symbolic forms. He is interested that the pupil understand the means, both objective and mental, by which he may, by himself, seek knowledge, arrive at valid reflections, determine pronunciations and spellings, acquire habits, memories, skills, etc. He must be taught how to study. To this end, he must be instructed in the technique of studying exactly as a runner must know correct form before he can practice running to good effect. The study lesson is to be contrasted with ordinary instruction because the chief interest in the first case is in mastering the technique by which knowledge, habits, etc., are gotten, rather than in acquiring the products themselves. Children do learn methods of study by imitating the instructor's method of teaching, particularly when the method employed is developmental, *i.e.* where the child is taught conclusions in close connection with the evidences therefor.

By repeatedly going through the procedure the pupil may incidentally acquire the method. But the study lesson deliberately aims to develop the method itself to the child. The range of these techniques of self-direction which may be taught the child are as varied as the teaching process itself. The child may be taught the technique of memorizing a poem, the use of the dictionary or cyclopedia, or the processes involved in good inductive or deductive thinking. The technique may be accomplished by much overt activity and fixed stages of procedure (*e.g.* consulting the dictionary) when it is readily checked and controlled by the teacher, or it may be chiefly an inner mental activity, with an exceedingly variable procedure (*e.g.* solving a problem in arithmetic) when it is necessary for the teacher to exercise the artificial control which comes from having the child tell what he is thinking. The various techniques of study and the suggestions and cautions which go with them are suggested by each type of teaching treated, for the teaching art is determined by the laws of the learning process. (See HABIT; MEMORY; STUDY: also DEDUCTION; INDUCTION.)

Teaching children to direct their own mental activities has chiefly dealt with inductive and deductive thinking in connection with textbooks and other special devices of schoolroom life. The following factors aid in developing the child's power for independent study: (1) the child must have incentives for study, largely from the needs of his own life; (2) the process must be initiated by the presence of a maladjustment due to the failure of old responses or the presence of new situations; (3) the child should be encouraged to summon his fullest resources, bringing all his pertinent knowledge (facts or principles) to bear on the situation; (4) the need of open-mindedness to new facts that apparently controvert his tentative conclusions must be urged; (5) the ideals of fairness, thoroughness and accuracy in accumulating further data from people, books, observations, and experiments must be insisted upon; (6) he must be encouraged to be cautious enough to suspect his own data, and to be skeptical of evidences and solutions offered by others; (7) the rigid selection and organization of knowledge on the basis of relevancy must be fostered; (8) the habit of verification should be thoroughly perfected, and (9) the student should be absolutely familiar with the tools of study (dictionaries, cyclopedias, gazetteers, year books, etc.), and habituated with the most economical methods of using them.

The study type of teaching in one form or another is applicable to all the school subjects. It is more readily used in some fields than in others, more particularly where data are concrete and available. It performs an increasingly valuable function as the child grows older, inasmuch as it frees him from dependence on the teacher and develops an independent power for self-direction. (See STUDY; THOUGHT.)

Discipline. — The school does not aim at intellectual responses alone; it calls for emotional responses as well. These responses of attitude are peculiarly important in the domain of moral education. In the school the problem of discipline constantly underlies all teaching. In its preventive aspects it is always there; in its corrective phases it is always latent, and may become an active dominant problem at any moment. Disciplining, while designed for obtaining immediate order, is also an educative process. Like ideas, emotions develop under exercise and resulting satisfaction, and become weakened under neglect or resulting dissatisfaction. Unlike ideas, however, emotions cannot be directly handled and controlled. The method of treatment is indirect; an emotion is developed, repressed, or reconstructed chiefly through handling its cognitive or motor associates. The inefficacy of direct prearranged moral teaching is based on our inability to manipulate the emotions in a direct manner. In general, there are three modes of controlling the emotions underlying behavior: (1) exemplary control, where the emotion is communicated through example, suggestion, and imitation. The strength of the teacher's personality lies in its power as a suggestive example. This influence of persons on children through the constant suggestion of values and through pleasurable and unpleasurable reactions upon their expressions of attitude is one of the most powerful disciplinary forces. (2) Ideational control, where the idea usually associated with the desired emotion is recalled so as to exercise both the idea and its associated attitude. Thus, the types of literature one reads habitually or the subjects of conversation to which one constantly recurs, tend to fix his values and ideals. All argument or persuasion, with a refractory pupil, is an attempt to redirect emotions through ideas. (3) Expressive control, where the emotion is exercised by expression through its characteristic bodily response. This mode of control is one of the most important, and may be used in various ways, each of which is to be found in traditional schoolroom practice. (*a*) Provide opportunity for acting out every desirable emotion; (*b*) reward desirable expressions; (*c*) neglect the undesirable response, by keeping it free from the stimulus that sets it off; (*d*) inhibit it by meeting every undesirable expression with a painful reaction upon it; (*e*) substitute a channel of desirable response for the one which is offensive. In general, the controls which operate through suggestion redirect the emotion better than those which suppress or evade it; the better schools therefore favor the suggestive, persuasive, and substitutional methods of correcting wrong emotional attitudes and their accompanying acts. (See DISCIPLINE; EMOTION; SCHOOL MANAGEMENT.)

Appreciation. — The emotional responses with which education deals include the æsthetic responses which recreate rather than stir men; *e.g.* beauty, humor, etc. The quality we call " good taste " is a subtle emotional product best gotten indirectly. The opportunity for developing " good form " and " good taste " is everywhere present at school; but like morality, taste is best gotten as a by-product. There are special opportunities and occasions when it is most likely to be developed, *e.g.* in the periods devoted to music, literature, and fine arts, and during the group celebrations of the school, its sociable occasions, its morning assemblies, and special festivals. Of all the qualities of mind that the school may develop, taste is most dependent upon spontaneous personal interest. Compulsion of any sort destroys the sense of enjoyment. It cannot be commanded; it may be suggested. The teacher and the environment may suggest it, but they must first possess it. Thus good taste in one's surrounding leads to imitation. The teacher may convey more real æsthetic appreciation through the suggestions of his voice, countenance, gesture, and other natural expressions, than by any exclamations of sentimental admiration or intellectual analysis of the technique which is the basis of the artistic construction. In fact, sentimentality and over-analysis actually interfere with true æsthetic appreciation. An intellectual appreciation of the structure of the fine arts may be deliberately planned and attained at will in the fine arts period, but like all affective states, the æsthetic attitude develops in the background and among the interstices of all such teaching. Our control is chiefly in providing normal conditions of enjoyment, and then avoiding specific conditions which we know to be destructive to the development of æsthetic feeling. (See ÆSTHETICS; ART IN EDUCATION; LITERATURE, INSTRUCTION IN.)

The types of teaching indicated above are based chiefly on the nature of the subject-matter or the state of consciousness involved. Those that are differentiations on the basis of the teachers' immediate pedagogical purpose are suggested below.

Instruction. — Direct teaching is known as instruction. The facts are conveyed more or less directly from the teacher's mind to the child, objectively, orally, or by readings. Showing the child the fact or telling him directly, without conspicuous attempt to let him gain it by himself, is instructing the child. Thus all classroom talks, lectures, conversation lessons, questioning, or catechetical methods are ways of telling the facts to the child more or less directly. The method of instruction is used when the teacher wishes to recall or present quickly a mass of information necessary for some later work. Such instruction may degenerate into a verbalism that does not really convey knowledge to the child. Again, the child may get mere fragments of knowledge from the telling, missing the larger points of the discussion or presentation because he is not interested in the topic or because the subject is not treated with reference to the child's past experiences. It is an economical method of teaching, but one which requires much caution to avoid the waste of sheer inefficiency. Any form of telling or reading from a book is less safe than such varieties of this method as the question and answer method, conversation lessons, etc., because the responses by the child permit the teacher to check results. In the best practice no one species of instruction is used, each is supplemented and safeguarded by the others. (See DIRECT METHODS OF TEACHING.)

Investigation. — At the opposite extreme to instruction where knowledge is directly conveyed to children, is the method of allowing the child to learn things for himself. Here, the teacher stimulates interest and provides the materials and instruments that are needed to acquire the facts. Such a procedure finds its sanction in the dictum " Never tell a child anything he can find out for himself." It has been called the method of discovery or rediscovery in elementary mathematics and high school science. In history it appears as the source method. Individual laboratory experimentation and personal manipulation of materials are different forms of indirect teaching, where the child's activity is stimulated and the teacher's rôle is reduced to supervision, and to a minimum of that. Often such teaching is investigative in form, but not in spirit. Too often it is a highly disguised way of telling the child. At any rate, it is not real discovery or rediscovery, for the conditions are so fixed that the needed facts emerge easily for the child. It is a slow method of acquiring knowledge, but a safe one. What facts the child discovers, he is likely to understand and retain. It takes account of interest and provides for initiative and individuality. It is a proper supplement to the method of instruction. It is least valuable and most wasteful when used with young children. (See DISCOVERY, METHOD OF; HEURISTIC METHOD; INDUCTION and DEDUCTION.)

Development. — Occupying a middle ground between the methods of instruction and of investigation is the developmental mode of teaching. In fact, it is a blend of the two types, with the effective qualities of each retained and the shortcomings largely eliminated. Here teacher and pupil coöperate, the child being allowed to contribute where he may do so, and the teacher assisting where such is most profitable. Where the teacher participates, it is always with such a presentation of information as would provide the materials in the order which is most natural for the child in acquiring them. The form of the presentation distinctly follows the child's psychological needs, stimulating a maximum of activity on the pupil's part. Everywhere the child's interests, experiences, and doubts are considered, and when, at last, he acquires the knowledge, he feels that it has a rational basis in his own life. He does not accept it on authority or through compulsion, but because his own activities, wisely directed by the teacher, tell him it is true. The developmental mode of teaching is distinctly indirect, as the teacher manipulates the conditions out of which the fact emerges into the child's consciousness. The teacher stimulates and guides without coercing or overtelling. Developmental teaching is usually associated with the content subjects and is largely blended with inductive, deductive, and study modes of learning. It may also be associated with objective, oral, and textbook methods of learning or with a combination of several of these. (See DEVELOPMENTAL METHODS; DIRECT METHODS OF TEACHING.)

Drill. — The teacher's purpose in drilling is to guarantee the automatic recognition or recall of an association. In the case of practice, which is to be distinguished from drill (though having much in common with it), the terminal of the association is some motor activity the stages of which are to be freed from the direction and control of consciousness. The terminal of drill may be an associated idea or form, of which the mind is usually more or less aware. Thus, one practices writing, drawing, singing, etc., but drills on phonetic reading, the addition combinations, oral spelling, and memory gems. The general laws of association guarantee fixation in drill; but these laws require some special modifications for application to practice work, when they are known as the laws of habituation. In practice one may start with a crude effort and gradually approximate perfection; in drill, one must have the correct impression from the start. Thus one may write very illegibly at the beginning; but one must know that "two and three are five" from the start. Thus practice perfects an approximation of perfect form; while drill fixes a connection already accurately made. The purpose of practice is perfection; that of drill is fixation.

When facts are comprehended, they are already partly fixed. The more interesting and rational the comprehension has been, the more nearly fixed is the series of associates. The drill activity succeeds and supplements such activities as instruction, recitation, study, development. It attempts to guarantee that the association which is now efficient, will be efficient after a lapse of time, so that any factor in the group of associates may be readily recognized or recalled. Among the factors influencing efficient recall are: (1) the accuracy of the first impressions; (2) the vividness of the impressions; (3) their frequency; (4) their recency; (5) the pleasurable or unpleasurable nature of the recall. Long before the drill activity enters as such, the first impressions have been made. Intensity of impression and a pleasurable reward for the right answer are psychological factors in learning which have probably been heeded in the work of development. The function of keeping things reviewed belongs dominantly to another type of teaching, the review. Hence, the drill depends upon the principle of frequency which it guarantees through repetition of the associated impressions. Traditionally, drill has meant repetition exclusively, and a very mechanical and futile repetition at that. In modern practice it means merely emphasis of the principle of frequency, and the fullest possible use of other secondary factors however slight.

Some of the more important guiding principles for the use of drill in teaching are the following: (1) Start with the correct impressions associated in the right practical order. (2) Be certain no factor necessary in the final product is omitted. (3) Rouse as much interest in or motive for the repetitions as you can. (4) Utilize as many channels of impression and response as are available. (5) Guard against the lapses which arise from carelessness or haste. (6) Give additional attention and repetition to elements of special difficulty. (7) As drill at its best is likely to be monotonous, do not prolong it to the point of diminishing returns. (8) Gradually lengthen the periods between drills.

Cramming is using the drill exercise as an initial and exclusive mode of learning. The interest in mastering the association is due to the transient importance of this skill for the achievement of some end other than permanent mastery of the connection for its direct uses to the learner.

While drill is usually associated with the association of forms and symbols, it is different from ordinary formal work, because in drill, the words or symbols are used to help fix a series of facts, whereas in traditional formal work, the chief function is to get symbols impressed and connected with other symbols and their common meanings. Thus in arithmetical drill the important thing is to connect facts in certain relations, *i.e.* to know that "two times three are six," while in the formal work of spelling, the chief thing is to get certain symbols in a given order, incidently guaranteeing other associates of corresponding symbols and underlying meanings, *i.e.* to know that the letters t-h-o-u-g-h are associated in a given order, and that they signify what we mean when we say "though." Drill is involved in formal work, as practice and other types of teaching may be. Formal work is an attempt to get the child to learn a certain kind of subject-matter; development, drill, practice, etc., are special ways of doing. (See ASSOCIATION; DRILL; EDUCATION AND INSTRUCTION; FORMAL WORK; HABIT; PRACTICE.)

Recitation. — As its name implies the recitation is an oral exercise. Its purpose is to test the child's comprehension of a given set of experiences. It is most often used to determine whether or not the pupils are ready to proceed to the next step. The unreadiness revealed, which may be due either to defective teaching or to inadequate preparation by the pupil, may be any sort of psychological defect from a lack of clear concrete images to an inability to apply his knowledge, from a wrong attitude toward the subject to a good verbal memory that glibly repeats phrases where there are no ideas.

The recitation used to be a mere hearing of lessons for the purpose of judging the child's preparation of his work during the study period or at home. Now it is just as much a judgment upon the teacher's skill. Where once it was used largely to the exclusion of other types of schoolroom activity, it is now itself greatly subordinated. As an exercise it follows any activity designed to give the child additional power, and reveals defects which it immediately proceeds to correct. During the recitation, obscure points are cleared up, generalizations given further illustrations, details given supplementation, and knowledge summarized. Usually, though not always, the recitation tests comparatively small units of teaching and learning, as the written examination covers a wider field. In the broadest sense, however, the recitation (so called) may test out the knowledge of the child through objective construction, written answers, or other means singly or combined. But the usual recitation is oral, a "question-and-answer" method, which when it aims at inducing or inferring additional knowledge from what the child already possesses, becomes a "Socratic method." Topical outlines prepared by the teacher or children are often made the basis for recitation work. (See DEDUCTION; EXAMINATIONS; RECITATION, METHOD OF; also TESTS; TOPICAL METHOD.)

Examination. — The written recitation or examination, as it is more often called, usually covers a large unit of teaching and learning. In consequence it is usually preceded by a review which it tests, exactly as a recitation tests a study or development lesson. It is more suitable for this purpose than the recitation, for it gives the child time and freedom from the immediate consciousness of the teacher to organize and formulate his ideas. It is more likely to be lacking in interest than oral work, and, as it assumes a certain independence of child and teacher, the latter loses the opportunity to safeguard the child against error and discouragement as these overtake him. For this reason written examinations for young children should not be very long. The examination as a final application of the study of more mature students is a stimulus that leads to the careful recall, organization, and summarization of materials previously acquired by small units. The use of the examination is a distinct economy in places where many can perform the activity at once, as in adding by columns; or where the work is more or less individualistic, as in composition. It is positively necessary as a means of drilling and testing skills which in life at large are always demanded in written form, as in spelling words.

The examination and recitation are applicable to almost all the school subjects, though in different degree. The recitation is best for young students; the examination finds an increased usefulness with older children. Overused, these two types of testing inevitably lead to cramming and other superficial forms of learning. (See EXAMINATIONS.)

Review. — The review is a device to repeat, recognize, and renew previous impressions. In terms of the factors in efficient recall, it adds frequency and system to one's associations. Formerly the review was too frequently a mere recall of facts previously learned, a kind of examination (oral or written) in which facts covering wide units of time were called for in the form in which they were originally learned. Now the review is literally a re-viewing of the field, as much to establish new relations of wide scope as to recall the facts themselves. Facts are given relative values, superordinated, coördinated, and subordinated, so that the review becomes a summary of all that has been learned of a topic and its subtopics in the previous lessons. The review is applicable to all the subjects, but more particularly to the content subjects calling for relations of thought, *e.g.* history, geography, civics, etc. Here the reviews are usually conducted by the use of abstracts or topical outlines. In the better practice, these outlines are an organization of the pupil's own thinking rather than the perfected product of teacher or author.

Practical application, as well as theoretic organization, is used in the conduct of reviews. In botany a child may be asked to identify a species new to him. In manual training where skills are involved along with knowledges, the plan of a project, involving a complex of previous trainings, may be given to the pupil for execution. Even in a subject such as reading, the child is constantly asked to read words which have been regrouped to express new thoughts. The old conception of a review as an extended reproduction of facts in the form in which they were originally learned is still dominant in the formal subjects in connection with which the review originated, — spelling, arithmetic, etc. Even here the method of the review has improved. Dictations of words, and a unified series of practical problems begin to take the place of long lists of unrelated words and abstract examples.

Too frequently in the past, reviews have been used arbitrarily. The time of their use has been determined on administrative rather than on psychological grounds. They came almost exclusively at the beginning of the school year and at the close. Such summaries are now given at the close of every topic of importance, the nature of the subject under consideration determining the place and extent of the review.

Assignment. — The assignment of a lesson to be studied implies a transition between one class lesson and another and is a provision for preparation in the interim. The assignment may cover the whole range of school work and may include: (1) work in formal association as in learning to spell, (2) practice in the perfection of skill, (3) verification or application of principles already mastered, (4) the acquisition of new information or principles, or other combinations of them. With the youngest pupils, still lacking in power of self-direction, the assignments usually call for drill, practice, or application. The older the student, the more frequently problems in acquiring and organizing knowledge are given for study. The nature of the assignments will necessarily vary with different school subjects and with children of different maturity. The assignment should grow out of the lesson just concluded. It should be a definite assignment by topics or problems, rather than by mechanical units (so many pages in the book). It should be fairly flexible so as to take into account children of varying capacity. Assignments should not be a haphazard unprepared activity squeezed into the last few remaining moments of the class period, but something deliberately undertaken within an ample provision of time. In the assignment of problems for study, the teacher should survey the field with the pupils, indicating the chief topics and the lesser problems, summarizing the facts of major importance with the assistance of the pupils. When unfamiliar words or statements are involved, it is usually more economical to explain these so as not to obstruct the more important activities. The method of study may also be suggested, the resources of largest service being indicated. The younger the children, the more the assignment should anticipate difficulties and suggest ways and means. The assignment may be more scant with older and more self-reliant students. H. S.

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TECHNICAL EDUCATION. — Since the term "Technical Education" is often loosely used, it should be clearly understood that it is herein strictly limited to education for the engineering professions. For the purposes of this article it is synonymous with "Engineering Education" or "Technological Education." The fact should not be overlooked, however, that many educational authorities do not agree to this limitation, but insist that any formal training involving the application of science to the arts of civilization is properly a department of technical education. Since in this *Cyclopedia* the various phases of this broader use of the term are covered under such headings as that of Industrial Education (*q.v.*), Household Arts (*q.v.*), etc., the term is here limited to include that training which prepares men for the major professions of engineering and for the subsidiary technological professions to which the modern subdivisions of pure and applied science have given rise. A comprehensive definition of the field embraced by those professions is that given by Mr. Stott in his presidential address at the twenty-fifth annual convention of the American Institute of Electrical Engineers (*Transactions*, 1908, p. 459): "Engineering," he says, "is the art of organizing and directing men, and of controlling the forces and materials of nature for the benefit of the human race." And what an engineer should be is defined by Vauban: "No engineer is perfect, because he must be a carpenter, a mason, an architect, a painter, an orator, a statesman, a soldier, and a good commander; above all, he must have amiability, ready wit, and long experience."

The beginnings of technical education are to be found, of course, in earliest history. The pyramids of Egypt and the aqueducts of many of the now vanished cities of antiquity show an engineering training of a high order; while the military roads and fortifications of the Romans are examples of practice useful even to-day. Yet in the modern meaning of education, that of exact preparation by a series of ordered steps toward a well-defined end, technical education is of very recent growth and has arisen in direct response to modern economic demands.

That response, however, has been made, as is true of all educational development, by a process of evolution out of existing forms and of subdivision and adaptation to changing needs. From this standpoint the origin of the diverse forms of the technical education of to-day is to be found in the training given from earliest times to those members of the military profession who had to do with the roads, fortifications, and other works essential to success in war. Military engineering gave rise, naturally, to civil engineering; and out of civil engineering, by a normal process of subdivision, have come the many other engineering professions which, in turn, will subdivide, as human knowledge extends, into still newer forms. And just as in the science and art of military engineering there was extensive differentiation of function, from the commander-in-chief down to the sapper and miner, so in the diverse technical professions there is an ever wider subdivision of activity, leading to many kinds and degrees of training. Moreover, each function merges into those above and below it, and gives rise, not only to a need for many varieties of training, but also to widespread confusion as to scope and nomenclature.

It follows, therefore, that institutions for so-called technical education have existed from a comparatively early date. Technical schools were to be found even in the eighteenth century; but as late as the middle of the nineteenth all such establishments were substantially trade schools, giving in a more formal way that industrial training which was then mainly carried on under systems of apprenticeship. The French, however, who were the true successors of the Romans in military and civil engineering, established before the Revolution, the *Ecole des Ponts et Chaussées* and the *École des Mines*, which soon achieved high standards. In the leading European states and in America, men of science were at the same time founding learned societies for the encouragement of science and of its application to the arts; and were providing mechanics' and other institutes in which, by lectures, classes, and museums, it was endeavored to improve the status of the sciences and arts; while the military arms of the great nations were so extending the scope of the education of their officers as to include much engineering training. Furthermore, the seeker for origins must not forget what is owed to men of the type of Benjamin Thompson, Count Rumford (*q.v.*), and Benjamin Franklin, and to other leading inventors, as well as to those men of science who, to the workers in their laboratories, were the first expounders of the application of science to the arts. Finally, technical education in the United States owes a scarcely appreciated debt to Dr. Jacob Bigelow, who, in 1829, in his volume, *The Elements of Technology*, produced an epoch-making work.

Attempting to fix, if it be justifiable to do so, more definite beginnings, the rise of modern technical education may perhaps be traced to four far-reaching events, which in themselves were due to more deep-seated causes: (1) the London Exhibition of 1851; (2) the passage by the Congress of the United States of the Morrill Act, in 1862; (3) the Franco-Prussian War of 1871; and (4) the Centennial Exposition at Philadelphia, in 1876.

The London Exhibition of 1851 was not only the parent of the extraordinary formative work carried forward at South Kensington; but it also opened the eyes of the European nations to the possibilities of sound technological training. This influence was repeated for America in the Philadelphia "Centennial" of 1876, which gave a new meaning to the somewhat feeble beginnings in technical education made possible by the land grants under the Morrill Act; and the Franco-Prussian War not only resulted in wresting from France her long supremacy in military engineering, but gave an impetus to Germany which, in thirty years, enabled her to take a place in technical education so far ahead of the other nations as to raise her from a comparatively poor agricultural people into her present position of industrial leadership.

In this connection it is interesting to note that the trend toward technical education in England was largely established by a German, the Prince Consort, who suggested that the profits of the Exhibition of 1851, increased by a Parliamentary grant of an almost equal amount, be expended in providing a permanent institution for the encouragement of science and art. Thus originated, in 1853, the Department of Science and Art at South Kensington, from which sprang the effective movement for higher technical education in Great Britain. Out of this grew the City and Gilds of London Institute for the advancement of technical education; as well as such institutions as Owens College, Manchester; University College, Liverpool; Yorkshire College, Leeds; and the Glasgow Technical College. To its influence, also, may be traced the development of technical education departments in such older institutions as King's College and University College, London, and the ancient universities of Oxford and Cambridge.

In Great Britain, as in other countries, the growth of true technical education came in answer to the strenuous demands of the rapidly growing industries for men properly trained to supervise and to develop those industries under the new conditions of production brought about by the utilization upon a large scale of water-power and steam. The men in charge of those industries were able by their practical experience to meet the doubts of the conservative educators, by their wealth to establish institutions attractive to young men, and by their urgent call for trained men to open to the graduates of such institutions financial opportunities superior to most of those available for men from the older colleges. Moreover, by their presence in Parliament and upon national and municipal boards, the leaders of British industry had it in their power to influence legislation toward these practical ends; just as in the United States men of the same type could command the votes of the Congress and of local legislators. Consequently the development of technical education has not only been phenomenal as compared with the earlier growth of general higher education, but it has also, because of the demand of manufacturers for men to lead in the industries, overshadowed industrial and trade education, progress in which, in America at least, has not kept pace with that of higher technical education.

The rapidity of development in engineering education has been paralleled by the range of interests which it has come to embrace, and by the extent of its differentiation in order to fulfill the demands of a long list of professions which, originally subsidiary, have become, by the progress of modern industry, major activities. Civil engineering was a direct outgrowth of the demands upon the military engineer for roads, bridges, and other structures; but civil engineering, which a generation ago could be undertaken as a single profession, is now of necessity subdivided into hydraulic engineering, railroad engineering, structural engineering, landscape engineering, sanitary engineering, and topographical engineering (to name only some of the main subdivisions); and each of these is again being rapidly subdivided into other specialties, for any one of which a man needs extensive training, and to the following of which he may profitably devote a lifetime.

The utilization of steam as a motive power led to extraordinary developments in mechanical devices, creating the profession of mechanical engineering, which, again, is not only subdivided, as in the case of civil engineering, into the professions of mill engineer, marine engineer, etc., but the work of which is closely coördinated with that of the structural engineer, the chemist, the electrician, and the miner.

Mining engineering, historically one of the earliest of the professions, made rapid strides coincident with the progress of the several sciences and arts, and is more and more closely affiliated with other engineering activities. Broadly speaking, it is divided into the profession of the mining engineer proper, whose chief interest is the securing of the ore, and that of the metallurgical engineer, whose main activity is its reduction for commercial use.

With the introduction, in the latter part of the nineteenth century, of electricity as one of the great forces of modern life, came a sudden demand for electrical engineers; and, at the same time, the application of the science of chemistry to the supplying of commercial needs made a place for the chemical engineer, who, in turn, is being differentiated into the chemical-mechanical and electrochemical engineer; while an appreciation of the dependence of the public health upon a well-protected water supply and upon proper disposal of wastes has produced the sanitary engineer. Out of these, and by a perfectly legitimate extension of the term, are coming such composites as the conservation engineer, the production engineer, and the publicity engineer.

Great Britain. — The focus, so to speak, of engineering education in England is the City and Gilds of London Institute, which exists "for the establishment of, or for assistance to, trade schools; for the conduct of examinations in technology; and for subsidizing other institutions, in London or in the provinces, having cognate objects." One division of the institute, the Central Institution at South Kensington, now the City and Gilds College, forms the engineering section of the Imperial College of Science and Technology, and is included as a school of the university of London in the faculty of engineering. The City and Gilds of London Institute maintains the Central Institution and the Finsbury Technical College, which provide three-year courses in the various branches of engineering; and closely affiliated with it is the "Engineering Branch" of University College; the "Department of Engineering and Applied Sciences" of King's College; the Royal College of Science (with which is incorporated the School of Mines), all in London; and some of the engineering colleges of the provinces. In most of these institutions there is such an overlapping of lower technical and trade instruction and that in pure science and in engineering; and so much of the work is carried on in evening classes, by "extension" lectures, and by what the English call the "sandwich system," — meaning a division of the student's time between the college and the industrial establishment, — that it is difficult to give a just outline of the curricula or to make comparisons with American conditions. It is fair to say, however, that, as a rule, the British engineering college is less well equipped with laboratory facilities and machines for practice than are those of the United States. This is due, in part, to the fact that the huge gifts made in America to higher education are unknown in England; but mainly to a settled belief on the part of British educational authorities that the kind of instruction comprehended under the term "laboratory work" can better be done in the works themselves. Dr. Corthell, in his admirable Report on Engineering Education (*Technology Quarterly*, Vol. XVI, p. 163), calls attention to the statement made by the authorities of Yorkshire College, Leeds, that "the scientific training at the college must be regarded as a means of acquiring principles that underlie the art of engineering, and the training in the works as necessary for acquiring the art itself"; and, again, to that made in the catalogue of Owens College, Manchester, that the instruction "is not intended to supersede the practical training, which can only be obtained at the office of a civil, or the workshop of a mechanical engineer." Dr. Corthell further says: "The same feature prevails . . . in all British schools (of engineering) and is still observed in after practice, viz.: apprenticeship and pupilage, where the young man becomes an 'articled pupil' or 'apprentice' in some civil engineer's office, or in some engineering construction works."

Not forgetting the Royal Indian Engineering College, Cooper's Hill, established in 1871 for training for the Indian service, the other leading engineering colleges in England are the University of Manchester, Leeds University, Bristol University, Birmingham University, Liverpool University, Sheffield University (*qq.v.*), Armstrong College, Newcastle-on-Tyne (see DURHAM UNIVERSITY); together with the engineering departments of Oxford and of Cambridge, which, although of comparatively recent origin, have already made valuable contributions to technical education. The Universities of Glasgow and of Edinburgh, and the University College of Dundee have departments of engineering; while the Glasgow and West of Scotland Technical College is doing notable work for trade as well as for higher technical training in Scotland. In Ireland there are engineering schools at Dublin, Belfast (*qq.v.*), Galway, and Cork, connected with their respective universities and colleges; in Canada excellent courses in engineering are provided at the University of Toronto, at McGill University, Montreal, and at King's College, Windsor, N.S.; while in India the Universities of Bombay and of Calcutta, and in Australia the University of Sydney, have courses leading to engineering degrees.

While there is wide variation in the character and scope of these British colleges of engineering, the conditions of admission are fairly uniform in that they require a good general training in mathematics, language, and history; and the length of study required for a degree is generally three years. Under the examination system common to all English higher education, this time may be considerably extended; and in some of the colleges at least five years are required for the full training of an engineer. The courses of study are largely made up of exercises in mathematics, in pure and applied science, with laboratory work, and in engineering work proper, with the independent working out by each student of some special problem or problems in his chosen profession. The general, or academic, subjects apparently occupy a quite subordinate place.

Because of the well-known fear of the British people that Germany is seriously imperiling their industrial supremacy, public attention is strongly directed, at the present time, upon the methods of training the industrial leaders of Great Britain; and many suggestions for change and improvement in the work of her technical schools are being made. The problem is inseparably bound up, however, with that of providing widespread, adequate training in elementary and secondary schools; and in this connection stress is laid by many English writers upon the need for the national organization of education in England. As expressed by Fabian Ware (*Educational Foundations of Trade and Industry*, p. 54): "All our energies must now be directed toward the organization of our secondary education. Unless we provide in the secondary sphere a broad general basis of instruction, we cannot expect to train our commercial and industrial leaders so that they shall be equal to those of our foremost foreign rivals."

United States. — The institutions for technical education in the United States readily divide themselves into three distinct groups: those founded largely by private beneficence as autonomous colleges limited to technological education; those attached, more or less loosely, to older universities, themselves independent of state or government control; and those which, as colleges of technology or as departments of universities, receive their chief revenues from state or federal appropriations. While these institutions vary greatly in the type and quality of their service; while each of them differs from all the others in the emphasis placed upon the teaching of this or that profession; while some of them attempt to comprehend the whole list of technical professions, whereas others concentrate their efforts upon two or three major courses of professional study, they are practically a unit in certain definite directions: (1) they require for admission a preparation at least equivalent to that given in the average public secondary school; (2) they demand four years of study in residence in order to secure the bachelor's degree; (3) they lay strong emphasis upon laboratory work in fully equipped laboratories, duplicating as far as practicable existing working conditions; and (4) they carry, parallel with the technical instruction, a considerable body of studies of a more general character, such, for example, as general science, English and other modern languages, economics, and history. The methods of instruction, moreover, have many points in common, being those largely of lecture-room exposition, supplemented by quizzes and intensive instruction in small sections and by work in a general or special laboratory; and by a considerable opportunity, in the higher years of the course, for independent investigation, under guidance, by the student himself. In more recent years some of the technical colleges (notably the College of Engineering of the University of Cincinnati) have been adopting and adapting the coöperative plan, or the "sandwich system" of the English institutions, under which the student divides his time between the college and the industrial establishment, earning in the latter an increasing wage which goes far toward paying the total cost of his education in the college. An important adjunct to this coöperative plan is the "coördinator," whose "function is to make a direct weekly coördination of the work of the shop with the theory of the university. One afternoon, for example, he may be at the shops of a local manufacturing company, where he will observe the student apprentices at work. The next week these young men will be grouped together with their classmates for two periods in class, when he will explain the functions of the particular articles, on which the students were working, in the machine which the local manufacturing company builds." It seems probable that this system of coöperative instruction will rapidly develop in the United States, not only for the training of engineers, but still more in the fields of trade education.

From the historical standpoint, the first, not only of the independent schools of technology, but of all such schools in the United States is the Rensselaer Polytechnic Institute (*q.v.*), founded by Stephen Van Rensselaer (*q.v.*), in 1824; but it did not develop into a true college of civil engineering, with a four-year course of study, until about 1850. Meanwhile there had been established, in 1847, in connection with Harvard University, the Lawrence Scientific School, and a few years later, in connection with Yale University, the Sheffield Scientific School, — both of which, however, languished until about 1860, when the demand by the growing manufacturing interests for technically trained men grew so acute as not only to stimulate these, but also to create other technical colleges. In response to this demand were established the Massachusetts Institute of Technology, chartered in 1861, and opened to students in 1865; the Worcester (Mass.) Polytechnic Institute, chartered in 1865; the Lehigh University (South Bethlehem, Pa.), opened in 1866; the Stevens Institute of Technology (Hoboken, N.J.), the Towne Scientific School of the University of Pennsylvania, established in 1874; the Case School of Applied Science (Cleveland, O.), incorporated in 1880; the Rose Polytechnic Institute (Terre Haute, Ind.), opened in 1883; the Polytechnic Institute of Brooklyn (N.Y.), reorganized into a higher technical college in 1889; together with a number of institutions of later foundation, some limiting themselves to engineering education, others embracing both lower and higher training.

The Land Grant Act (the so-called Morrill Act) of July 2, 1862, for the "endowment, support, and maintenance of at least one college [in each state], where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts," gave a marked stimulus to the teaching of applied science in existing state universities and to the creation of new institutions in which engineering training should play an important rôle. From this beginning have grown engineering colleges in the state universities, such as those of Wisconsin, Illinois, Michigan, Ohio, and Minnesota, and separate institutions such as Cornell, Purdue, and the State College of Pennsylvania, that take high rank among engineering colleges, and the attendance upon which is increasing by leaps and bounds. Meanwhile, the older endowed colleges, such as Princeton, Columbia, and Dartmouth, have provided engineering departments, usually given a distinctive name, which follow closely the lines established earlier by the Lawrence and Sheffield Schools.

At Columbia University the School of Mines was opened in 1864 under Professor Thomas Egleston as professor of mineralogy and metallurgy. The school was formally adopted as a coördinate branch of the university or college, as it then was, in 1865. The school aimed to train mining engineers and metallurgists, but courses were added later in civil engineering, applied chemistry, sanitary engineering, geology, and architecture, many of which became independent schools.

In the United States, as in the countries of Europe, there has been from the beginning much controversy as to the relative advantages of technical education carried on as a part of the work of a university or upon a wholly independent basis; but, as far as the United States is concerned, this argument, as well as that regarding the advantages and disadvantages of state control, must be largely academic. In face of the great demand for technically trained men, of the varying needs of those men, and of the diverse conditions under which they are to be educated and are to work, it would seem that there must always be a place for every legitimate variety of engineering institution.

While it is to be expected that in technical colleges of the three distinctive types above referred to, and scattered, moreover, through every part of the United States, there should be much variation in methods and results, there is remarkable unanimity among them as to requirements for admission. It is true that a few engineering schools, regarding their work as purely professional, demand as a preliminary the bachelor's degree. Notable among them is the scientific department of Harvard University, which, splendidly endowed by the late Gordon McKay, has replaced the Lawrence Scientific School. On the other hand, a considerable number of so-called engineering schools, run for personal profit, are more or less indifferent as to the maintenance of standards. But the vast majority of technical schools are a unit in demanding the equivalent of a good secondary school training, with special emphasis upon mathematics, together with that maturity and earnestness of mind on the part of the student usually associated with law and medicine. For this reason the percentage of "dropped" students is generally much higher in these than in the usual college. This fact, together with the immediate practical use to which their training can, as a rule, be put, makes these institutions high in favor with manufacturers and men of business, leading to perhaps an exaggerated estimate of their superiority.

On the other hand, the spirit of immediate practical advantage in which the average student at an engineering college pursues his work tends toward a neglect on his part, — and possibly on that of his teachers, — of those broader and finer things in education which are of the most real value; thus giving color to the claim that many graduates of technical colleges are not, in the true meaning of the term, well-educated men. This is a real danger, of which the technical institutions have always been conscious and which most of them are continually seeking to overcome.

For this reason, not only most of those colleges of engineering in the United States which are an integral part of a university, but also most of those which exist for the sole purpose of preparing men for the engineering professions, infuse into their courses of study a large measure of so-called academic studies. A sound knowledge of mathematics, as well as a thorough laboratory experience of the principles of physics and chemistry, is fundamental to all their curricula; but in addition to this, there will be found in the courses of study of almost all American technical institutions a liberal measure of serious work in the use of English, in the reading of other modern languages, in history, economics, and kindred subjects fundamental to breadth of vision.

In the teaching of the technical and professional subjects there is, however, wide and healthy variation. In some institutions much emphasis is laid upon broad, underlying principles, leaving the applications to be wrought out in actual experience; in others the greater part of the student's time is given to the working out of daily practical problems. In some the side of pure science is developed at the expense of the arts; in others the training borders closely on empiricism. In this institution one will find a few broad courses of a quite general character; while in that he will see a list of studies divided and subdivided into the very minutiæ of professional practice. In all of them, however, there seems to be an increasing inclination to ally the work of the college more and more closely with the factory, the field, and the shop, for the sake not only of bringing the young men into touch with actual working conditions, but also of making available as laboratories the exceedingly expensive plants which the manufacturer has to provide, but which few, if any, engineering schools could hope to secure.

As is to be expected in view of the demands of industry, the bulk of the students in the American technical colleges are following the four major professions of civil, mining, mechanical, and electrical engineering; and the general methods of teaching those professions exhibit both considerable uniformity among the many institutions, and marked similarities among themselves. While the field of the former two professions, as distinguished from the latter two, is more largely in the open, training for all four of them is practically the same: a strong basis of mathematics and general science in the earlier years, followed by specialized technical work in the later; and all the work, as far as possible, made real to the student by extended experience in the laboratory, whether that laboratory be the ground on which the student is to lay out a railroad, the shop in which he is to construct a machine, or the laboratory proper, in which he is to dress and smelt ore or make measurements of the units of electricity. And the same principles of instruction are carried, not only into the preparation for the many other engineering professions which have grown out of these major ones, but also into such others as architecture, which enters the field of art as well as that of science; geology, which seems to lean more toward pure than toward applied science; and agriculture, which is still far from having reached the exact bases upon which rest the purely engineering professions.

Because of this increasing uniformity in methods, the engineering and allied professions, while, on the one hand, continually differentiating within themselves, are all the time approaching more and more toward one another, each of them becoming increasingly dependent upon the researches and the practical results of all the rest. For this reason, the problem of administration in the colleges of technology is every day becoming more vital, since it is essential that there should be such perfection of educational control that there shall be the least possible duplication of instruction and the closest correlation among all the subjects taught.

As to the general problems of administration, they are not markedly different in independent technical colleges from those in institutions of the older type; while, of course, in engineering schools which are parts of endowed or of state universities, the administrative questions of the subsidiary department are practically those of the university as a whole. These are discussed under other heads. (See College, American.)

Germany. — The acknowledged supremacy of Germany in lower technical education, and her position well at the front in higher technical education, are due to three main influences: (1) the early and active realization on the part of German manufacturers that their success depended upon the employment of thoroughly trained technicians; (2) the spirit in which a German youth enters upon his education for a career; and (3) the lively interest of the government and especially of the present Emperor in the progress of engineering education. Mr. Beilby, a manufacturer of Glasgow, Scotland, puts the matter clearly when he says (*Nature*, Vol. LXXX, p. 22): "I attribute the leading position of

Germany in certain chemical industries more to the appreciation by her commercial leaders of scientific methods than to the mere possession of a multitude of highly trained graduates in science"; and, again, when he declares that "what strikes one most on comparing German with English education is its technical character. . . . Students in Germany do not flock to the universities to acquire a smattering of culture. . . . They go there to study what will be useful to them in their future career. . . . He (the German student) acquires at the university or technical high school a special knowledge which has a distinct relation to his business; and, as a result, he learns to realize the importance of expert help and is constantly watching for the opportunity of applying to the improvement of his trade any discovery or new invention which his technical knowledge suggests is worthy of his trial." Moreover, it is largely due to pressure from the Kaiser that privileges have recently been conferred upon certain of the technical high schools, by virtue of which they may now confer degrees which rank with those of the older universities.

There are at present eleven fully equipped technical high schools in Germany, based in most cases upon earlier existing trade schools, but which are now true engineering colleges. The oldest of these is that at Charlottenburg, founded in 1799 by the fusion of two existing institutions. Then follow, historically speaking, the schools at Darmstadt (1822), Carlsruhe (1825), Munich (1827), Nuremberg (1829), Augsburg (1833), Dresden (1828), Stuttgart (1829), Cassel (1830), Hanover (1831), and Brunswick (1835). Since then schools have been established at Aachen, Dantzic, and Breslau. In the beginning all these institutions were simple trade schools with but few pupils. To-day their courses have been raised to highest rank and are highly specialized, while attendance upon them has more than kept pace with the phenomenal growth of population and of activity in manufacturing in the German Empire.

The technical high schools of Germany are, generally speaking, managed by their faculties, who elect a rector, holding office for only a short time and whose appointment must be approved by the government. While in all German universities attendance upon classes is, from the American point of view, quite unregulated, no student may enter a technical high school until he has received the equivalent of a twelve years' course in the preparatory schools; and he cannot secure the degree of "Diplom-Ingenieur" until he has taken courses requiring practically four years' study, and, in addition, has spent at least a year as a special apprentice in some industrial enterprise. "Fortunately," says Dean Shepard (*Bull. Soc. Prom. Engineering Education*, Vol. I, p. 196), "the industries realize the importance of the practical training of their future officers and many works coöperate with the schools by providing courses for their benefit. It is rare that the student workman receives any pay while engaged on such a course. On the contrary he usually has to pay for the privilege of taking it. In such courses, the student is shifted through the whole plant, and is given opportunity to study all of its processes and methods that are appropriate for his instruction. In order to get credit for his practical work, the student must bring a certificate from the employer."

The requirements, not only that the student shall have had this year of practical experience, but also that he shall have given at least one year of military service, coupled with the facts that the training of the boy in the elementary and secondary schools of Germany is far more exacting than in the United States, and that the student in the technical school is thrown largely upon his own resources, produce an engineer who is not only older in years, but also more mature in experience and in judgment than the average graduate of an engineering college in America. Whether or not it would be wise to adopt — so far as that would be possible — German methods in the schools and colleges of the United States, it must nevertheless be recognized that those methods have given Germany a leadership in applied science and in industry which she will keep unless the educational authorities of other nations find some way of producing men of like caliber.

France. — As has been said, engineering schools of high rank existed in France long before they arose among other nations. Those schools, of course, were disrupted by the Revolution; but the Committee of Public Safety, only a few weeks after the fall of Robespierre, gave origin, full fledged, as was the fashion in France at that time, to the *École centrale des Arts et Métiers*, which, though somewhat lower in rank, is still one of the three great technical schools of France, the other two being the *École des Ponts et Chaussées* and the *École des Mines*. All are under government control; and, since their purpose is to recruit the higher technical civil service of France, just as West Point and Annapolis are designed to recruit the higher military service of the United States, they are rather to be compared with those institutions than with the American college of technology. The course in the *École centrale* is three years; that in the other two institutions, five years; and nowhere in the world, probably, is more thorough instruction given by men of greater eminence than in these schools. The most distinguished engineers regard it as a high honor to give lectures therein and to criticize the work of the students. Therefore, the youth is brought into personal relations with the men highest in his chosen profession in a way that would otherwise be impossible. Largely because of this, the standards and the *ésprit de corps* among French engineers have been and are kept so high. The elaborate bureaucracy of France permits of sending the students of these institutions, during the summer months, upon " missions " into the Departments, during which they are formally attached to public works under construction, giving them an admirable practical experience. Beyond this, instruction is carried on largely by lectures, by the preparation by the student of *projets*, criticized by his professors, and by frequent examinations of a severe character.

Preparation for admission to these highest technical schools is carried on in *Ecoles polytechniques* or in the ordinary secondary schools, wherein, under a decree of 1902, scientific studies now have equal recognition. Moreover, the tendency in France, as elsewhere, is strongly toward those courses in which science and its applications have a prominent place. For this reason, the older, classical universities are establishing chairs for science and are equipping laboratories for experimentation and research. It will doubtless soon be true in France, as in England and America, that it is technical education which is rejuvenating and in many instances rescuing from decay institutions that long resisted the modern technical teaching as being, in their opinion, subversive of true scholarship. And there is no question that, while a generation ago the higher technical school was scarcely acknowledged to be an educational institution, it is regarded to-day as a most important factor in all national development.

Other Countries. — *Switzerland.* — One of the most famous of engineering colleges, and deservedly so, is the Polytechnic School of Zürich. From it engineers of the highest rank in all parts of the world have been graduated; and the Institution is considered, as is indeed the whole educational system of Switzerland, worthy of close study by those seeking the best in teaching. Following closely the model of Germany in the character and thoroughness of its instruction, Zürich does not adhere to the doctrine of *Studienfreiheit*, and her students are held to a responsibility for attendance, for frequent recitation, and for definite promotion that resembles the system in vogue in the engineering colleges of the United States.

Austria-Hungary. — The technical institutions of this country are substantially similar in their form of governmental administration, conditions of admission, courses of instruction, and " freedom of study " to those of the German Empire. The earliest to be established was that at Prague (1806); the four others are located at Vienna, Brünn, Gratz, and Lemberg. The total attendance is over ten thousand students.

Russia. — This country, which early developed a course of shop work at the Imperial Technical Institute at Moscow, results of which were exhibited at the Centennial Exhibition at Philadelphia, has not been behind in providing adequate preparation for students of technical education. With the exception of the polytechnic school at Riga, which is supported by the citizens, the Russian engineering colleges are governmental and, as in France, are the recognized gates to the engineering civil service. There are technical institutions at St. Petersburg, Moscow, Helsingfors, Rarkoff, Kieff, Warsaw, and at Tomsk, Siberia. As would be anticipated, the Russian institutions combine the characteristics of the German and the French systems of engineering education.

Scandinavian Countries. — In view of the well-known fact that the " people's schools " of Norway, Sweden, Denmark, and Finland are among the best and the most far-reaching in their influence in the world, and in view of the high reputation of Scandinavian men of science, manufacturers, and engineers, it is to be expected that excellent provision should be made in all those countries for technical education. The thoroughness, the availability, and, above all, the practical quality characteristic, for example, of the Danish " high schools " are to be found, also, in connection with the higher technical institutions of all these Northern countries.

The technical education provided by the governments of other European countries is of a high order, and is modeled closely upon that furnished by the Republic of France. At Ghent and Liège, in Belgium; at Delft, in Holland; at Rome, Milan, Turin, Padua, Bologna, Naples, and Palermo, in Italy; and at Madrid, in Spain, are government schools, resembling, *mutatis mutandis*, the *Ecole des Ponts et Chaussées*, and from them have come many of the most distinguished engineers of Europe. In addition to these, as, for example, at Brussels and Louvain, in Belgium, are other endowed technical schools, graduates from which, as a rule, are also admitted to the engineering civil service of their respective governments.

Typical Organization. — Since it is obviously impossible to give in the limits of an article like this even the barest outline of the essential facts concerning such a multitude of diverse institutions established to meet the demand for technically trained men; and since, on the other hand, it is desirable to furnish at least a type of what is implied in technical education, the following outline of the work of the Massachusetts Institute of Technology may be taken as a fair representative of the engineering colleges.

Fourteen distinct courses, each leading to the degree of Bachelor of Science, and most of them permitting of subdivision, are offered, as follows: —

I.	Civil Engineering	1. Hydraulic Engineering 2. Railroad Engineering
II.	Mechanical Engineering	1. Engine Design 2. Locomotive Construction 3. Mill Engineering 4. Heating and Ventilating Engineering 5. Steam Turbine Engineering
III.	Mining Engineering and Metallurgy	1. Mining and Metallurgy 2. Metallurgy 3. Mining Geology
IV.	Architecture	1. Architecture 2. Architectural Engineering
V.	Chemistry	1. Physical Chemistry 2. Analytical and Industrial Chemistry 3. Sanitary and Municipal Chemistry
VI.	Electrical Engineering	
VII.	Biology and Public Health	1. Bacteriology and Industrial Microbiology 2. Sanitary Biology and Public Health
VIII.	Physics	1. Chemistry 2. Mathematics
IX.	General Science	
X.	Chemical Engineering	
XI.	Sanitary Engineering	
XII.	Geology	
XIII.	Naval Architecture and Marine Engineering	
XIV.	Electrochemistry	

In most of the departments, moreover, advanced courses leading to the degrees of Master of Science, Doctor of Engineering, and Doctor of Philosophy are also offered. In all the departments opportunity for special research is provided; and in physical chemistry, applied chemistry, sanitary science, and seismology, distinctive research laboratories have been established.

Admission to the undergraduate courses is by examination. The candidate must have reached the age of seventeen and must show proficiency in mathematics, physics, English, elementary French and German, and history. In addition he must take two so-called elective examinations from among a list that includes advanced French or German, Latin, chemistry, biology, mechanical drawing, and advanced English or history. The work is substantially the same for all students during their first year, embracing advanced mathematics, inorganic chemistry, mechanical and freehand drawing, English, German, physical training, and military science. At the middle of the first year, however, the student makes choice of his course; and thereafter there is continually greater differentiation among the several courses until, in the second half of the fourth year, the candidate for a degree gives a large part of his time to the carrying on of some original investigation, together with the preparation of a thesis embodying its results. A large number of graduates of other colleges enter, without examination, the second and third years of the various courses.

"In the first annual catalogue it was stated that The laboratory arrangements of the school are designed, when complete, to embrace the following departments: (1) Laboratory of Physics and Mechanics; (2) Laboratories for Chemical Analysis; (3) Laboratory for Metallurgy; and (4) Laboratory for Industrial Chemistry. A high value is set upon the educational effect of laboratory practice, in the belief that such practice trains the senses to observe with accuracy, and the judgment to rely with confidence on the proof of actual experiment."

The system of laboratory instruction thus inaugurated has since been greatly extended, and now includes the following:—

The Engineering Laboratories, including the Laboratory of Applied Mechanics, the Steam Laboratory, and the Hydraulic Laboratory.
The John Cummings Laboratory of Mining Engineering and Metallurgy.
The Kidder Chemical Laboratories.
The Research Laboratory of Physical Chemistry.
The Research Laboratory of Applied Chemistry.
The Augustus Lowell Laboratories of Electrical Engineering.
The Biological Laboratories.
The Sanitary Research Laboratory and Sewage Experiment Station.
The Rogers Laboratory of Physics, including laboratories of General Physics and the special laboratories of Heat Measurements, Physico-chemical Measurements, and Electrochemistry.
The Geological and Mineralogical Laboratories.
The Hawaiian Volcano Observatory.
The Mechanical Laboratories.

As a typical course, that in Mechanical Engineering (excluding the first year, practically common to all courses) is transcribed in a condensed form.

Second Year

Mechanism and Valve Gears
Mechanical Engineering Drawing
Mathematics
Applied Mechanics
Descriptive Geometry
Woodwork and Pattern Making
Physics
German
Physical Laboratory
Precision of Measurements
English Literature
European History

Third Year

Heat Engineering
Machine Drawing
Mechanism of Machines
Mechanical Engineering Drawing
Boiler Design
Applied Mechanics
Mathematics
Physics
Electrical Engineering
Surveying
Heating and Ventilation
Forging and Foundry
Vise and Bench Work
Political Economy
Business Law
General Studies (Economics, English, Modern Languages or History)

Fourth Year

Dynamics of Machines
Machine Design
Power Plant Design
General Engineering Lectures
Engineering Laboratory
Theoretical Hydraulics
Hydraulic Engineering
Applied Mechanics
Electrical Engineering
Factory Construction
Foundations
Refrigeration
Industrial Management
Machine Tool Work
Thesis

Options

Engine Design
Locomotive Engineering
Mill Engineering
Heating and Ventilating Engineering
Steam Turbine Engineering

J. P. M.

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TECHNICAL HIGH SCHOOLS. — See High Schools; Industrial Education; Technical Education.

TEETH, HYGIENE OF THE. — Modern studies have shown that the normal development and proper care of the teeth are essential conditions of efficient school work. If there is malocclusion of the teeth, a contracted dental arch, or the like, there is likely to be also some nasal deformity, and frequently eye trouble, perhaps squint or emblyopia, caused by deformities of the bony orbit coincident with the dental irregularity.

A common series of defects is: imperfect alignment of the teeth, loss of mastication, caries, disease, crowding of the tongue, nasal deformity, and general unsanitary condition of the mouth and nose. All the different forms of malocclusion, however, which have been classified by Dr. Angle, taking the occlusion of the sixth-year molars as the norm, can be remedied by proper treatment during the period of growth; and such treatment is necessary to insure the development of the bony structure of the mouth and nose essential for normal respiration and normal speech and healthful condition of the mucous membrane. There are four marked periods in the evolution of the teeth, first the period when the baby molars are developing, usually about the age of two; second, the period when the first permanent teeth, the sixth-year molars, appear, usually about the sixth year of life; third, the period when the second molars appear, usually about the age of twelve; and fourth, the period when the last molars, the so-called wisdom teeth, appear, usually not before the age of seventeen or later. Studies by Dr. Wright of Harvard indicate that the tonsils may enlarge without infection at any of these four periods; and that although slightly enlarged they return to normal with complete eruption of the molars; and thus in many cases excision of the tonsils becomes unnecessary with proper development of the teeth.

Many investigations of caries among school children have shown that from 70 to 100 per cent of European and American children suffer from caries, and certain significant correlations apparently exist, among them the following: people in the country seem to have poorer teeth than those in the city. There seems to be a correlation between the percentage of sound teeth in the community and the amount of lime in the soil of the locality. Children with defective teeth do not apparently succeed as well in school work, and there is likely to be a direct correlation between the condition of the teeth and physical development. Among the causes of defective teeth now recognized are deficient lime in the soil, general lack of nutrition in the individual, and the use of soft starchy foods, and the like. The immediate cause is the formation of lactic acid from the starch and sugar of food left in the mouth, *i.e.*, lack of oral cleanliness.

The results of defective teeth have been frequently shown. Among the more serious are indigestion, neuralgia, headache, earache, cardiac disturbance, subacute blood poisoning, and various nervous disorders. It is now thought that decayed teeth are also often a cause of many serious infections, especially tuberculosis.

The importance for school hygiene of proper care of the teeth can hardly be emphasized too strongly. It is impossible to have suitable cleanliness and fresh air with 70 per cent of the children suffering from caries; and with the ordinary lack of care of the teeth the atmosphere of the schoolroom is likely to be contaminated. If the actual surface of the decayed and uncleanly teeth in the ordinary school class could be made visible on one surface of the schoolroom, people would cry out in horror at such unpardonable lack of cleanliness; but what is not seen is apt to be ignored. Again, it is impossible to have the most efficient work in school classes where half of the pupils are liable at any time to have the toothache and frequently headaches, neuralgia, and the like, as the result of decaying teeth. And further it is impossible to have normal development and normal functioning of the nose and the respiratory organs without normal development of the teeth, and it is impossible to have immunity from infectious diseases and many disorders of digestion and the like without proper care of the teeth.

Dental clinics have now been established in connection with many schools. In Strassburg in Germany under the direction of Dr. Jessen the work of the clinic has been very successful, and experiments with clinics in this country already seem to emphasize the importance of establishing them in all cities. This should be supplemented by the work of a dental nurse, a plan which has been tried with success in some places. (See Medical Inspection.) It is desirable that children should be instructed in regard to the proper care of the teeth. Dr. Potter recommends the use of the following printed slip which may be hung in the schoolroom: (1) The teeth should be thoroughly brushed after each meal. (2) A tooth powder used on the brush helps to clean the teeth. (3) Candy and crackers should not be eaten between meals; they cause the teeth to decay. (4) The slow and thorough chewing of hard food helps to preserve the teeth and keep the mouth in a healthy condition. (5) Children's teeth should be examined by a dentist at least twice a year.

More important, however, than any instruction is proper training of the children. Either in the home or in the school or in both they should be trained to eat proper food, to chew their food thoroughly, and to clean their teeth properly by the use of suitable brushes and tooth powders and the like. In a word, they should be trained to the luxury of a clean and wholesome mouth. In this way alone will it be possible to bring about better dental conditions among school children. Dental clinics, nurses, instruction, are all essential, but as a means of positive hygiene nothing can take the place of the training of the individual child. W. H. B.

See Nose, Hygiene of the; Voice, Hygiene of the; Tonsils; Medical Inspection.

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TELEPATHY. — The term was introduced by F. W. H. Myers in 1882 to designate the theory of action at a distance of mind upon mind, apart from the recognized channels of sense. The presumption for such a possibility rests upon popular belief in clairvoyance, in the admonitions of the dying, in "mind reading," and has led to theories of "brain-waves," "psychic force," etc. The investigation of telepathy has formed a considerable part of the activity of the Society for Psychical Research. (See Psychical Research.) The experiments in muscle reading (see Muscle Reading; Subconscious), though typically directed to the detection of objects, numbers, letters, etc., through mental concentration upon their position, and on the basis of contact between the muscle-reader and his subject, occasionally suggested a similar success without contact and an extension from the reading of position to that of content. The "willing game" took the form of concentrated effort upon the part of an agent or agents to will a percipient to perform a certain action, or to transfer to the mind of the percipient an image, a message, or other simple mental content. Controlled and extensive experiments were carried out upon this model, the percipients in some cases professing special expertness, or being thrown into a state of hypnosis to heighten the percipiency. The logical force of such evidence depends upon the exclusion of normal means of communication; and this in turn suggests the possibility of undetected collusion between percipient and agent, and of involuntary whispering, signaling, or clews; while in some instances, as in the guessing of numbers, independent but similar brain-functioning (preference for like numbers) may become a pertinent factor. The records of the S. P. R. show cases of collusion detected or confessed, in some cases long after the experiments were accepted as evidential. The most significant issue of these experiments is the demonstration of involuntary whispering and undesigned gesture clews (looks, breathing, etc.) on the part of agent and percipient acting in good faith. A series of trials resulted in ninety successes with agent and percipient in the same room, when chance alone would allow only eight; with percipient and agent in different rooms, the successes were no more frequent than chance allowed. While those disposed to accept telepathy infer from this the limitations of the "force," the logical conclusion points to involuntary clews as an adequate explanation. The analysis of such experiments in sensory terms of the suggestion which is their probable source, is important.

The other type of evidence is typically in the form of vivid impressions or admonitions coincident with the death or other critical situation of one of the parties. Logically the elimination of chance coincidence is the decisive factor in cases presumably free from faulty observation or record. The possibility of hallucination is here pertinent. The S. P. R. instituted a large census of hallucinations. Seventeen thousand replies revealed nearly 1700 persons who had such experiences; of these, in 350 cases, the individual involved in the experience was recognized, and in thirty of these the appearance was coincident with the time of death of the individual; and this, it is calculated, is 440 times more frequent than chance would allow. In addition, the peculiar impressiveness and corroborative detail of some of the cases are offered as additional evidence. The serious, and to many critics, decisive argument against the presumption of the action of telepathy in such cases applies to the inevitably loose and complex assumptions involved in the calculation of chances, together with the large play of subjective prejudice in favor of shaping or exaggerating the coincidence.

The general result of these investigations has for the most part not been accepted as advancing the theory of telepathy to a more probable status. Within the S. P. R. there are some who regard the evidence as imperfect but not negligible, and others who accept the reality of telepathy and use it as an hypothesis to account for the revelations of mediums, for the "veridical" nature of premonitions, for the genuineness of "phantasms," etc. It is this use of the hypothesis that seems to many critics peculiarly objectionable and unwarranted; and it is this phase that has led to the more extreme and extravagant positions of "psychic researchers."

J. J.

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See also references under Psychical Research.

TEMPERAMENT. — The classical division of temperaments into four main groups, choleric, sanguine, melancholic, phlegmatic, has little more than suggestive value. It not only presents a scheme far simpler than the facts justify, but it also tends to obscure certain overlappings of the types which it recognizes. None of the classifications thus far suggested has met with general favor. Temperament is the individual's native predisposition to a certain emotional tone. It is often contrasted by psychologists with mood (*q.v.*), which is the relatively momentary and transitory state, as over against temperament which marks the persistent underlying emotional tendency. Mood and temperament may accordingly be at variance in any given instance, but commonly they are, and must be, in accord.

Emotions constitute an important part of the mind's racial heritage, and the bodily expressions of emotion belong to the instinctive portion of our organization. Through its relations to emotion, temperament consequently reaches down into our common hereditary antecedents, but it represents, nevertheless, one of the most striking instances of individual variation, as may readily be observed in any large family of children. The sources of these variations are not difficult to understand, although we may be quite powerless in a given case to designate them and there are undoubtedly many at present unknown to us. Broadly speaking, the causes determining temperament may be divided into two groups: (1) those arising from the *indirect* results of the metabolisms of the organism and especially from the chemical products of certain organs like the thyroid gland, and (2) those springing from *direct* nervous impulses reaching the brain from the various organs of the body, including the muscles.

Undoubtedly one of the most invariable determinants of temperament is the alimentary tract. The victim of chronic indigestion may enjoy logical processes of perfect lucidity and accuracy, but a buoyant, optimistic, cheerful temperament is not likely to fall to his lot. Certainly a large amount of the world's pessimism is digestive in origin. Any abnormality in the important organs of the body is likely to produce radical alterations in temperament, and the normal functioning of the important glands is peculiarly essential to mental health. The retardation of mental development due to atrophy of the thyroid is now well recognized, and the temperamental disturbances due to disorders of the sexual glands are equally well understood. Clearly the tone of the emotional life is continuously subject to these organic conditions which presumably exercise their effects on the nervous system in large measure indirectly through the chemical changes produced in the blood.

The brain is in constant receipt of nervous impulses originating in many parts of the body and not least important are those which come from the muscles. The general mental tone of an organism supplied with vigorous highly innervated muscles is very different from that of an organism provided with flabby muscle tissue feebly active. The emotional life of a person with a very irritable heart muscle is certain to differ from that of an individual with a more stolid cardiac organization. The nervous system itself varies in different individuals as regards its irritability, the speed with which it transmits impulses and innervates muscles, as well as in the rapidity with which it tires. All these variations are reflected in temperamental differences.

In the educational treatment of temperament, its organic basis must be constantly held in mind. Socially obnoxious forms should be treated as far as possible by lessening or removing the organic foundation, if this can be discovered and controlled. Such treatment to be very successful ought to begin in infancy. In later life the moral and mental forms of treatment are more available. But it must be remembered that while character and overt habits may be developed in directions seemingly at variance with temperament, the temperamental bias itself is organic and never can be wholly overcome or altered save on the basis of organic change. Change of temperament is primarily a matter of applied physiology, hygiene, and medicine. J. R. A.

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TEMPERANCE INSTRUCTION. — A term generally applied in the United States to special instruction concerning the physiological effects of stimulants and narcotics, chiefly alcohol and tobacco. Such teaching as a part of elementary physiology and hygiene is required by law in the public schools of elementary and secondary grade in the majority of the states. The school laws of New York and Illinois require temperance instruction in five years of the elementary schools and in the first year of the high schools. Furthermore, the laws of these states specify that the teaching of physiology and hygiene, including temperance, shall be from textbooks for all pupils able to read; one fifth of the pages of the books for elementary schools and at least twenty pages in those for the first year of high schools shall be devoted to the effects of stimulants and narcotics; and such matter relating to temperance shall not be included in one part of the book, but be distributed among the leading chapters. In all other states the laws are much less definite in requirements; some of them briefly state that the nature and effects of alcoholic drinks and narcotics shall be taught in the public schools, leaving the professional educators to select and arrange the matter to be taught. However, in most of the states the teaching of elementary physiology and hygiene has been influenced decidedly by the requirements of New York and Illinois, for in those states are the great publishing firms, and the very best textbooks have been arranged in line with the most extreme requirements.

Temperance instruction was included in some American textbooks for young pupils at least as early as 1839. About 1880 Mrs. Mary H. Hunt, an official of the Women's Christian Temperance Union, undertook to secure legislation requiring "temperance instruction," or "scientific temperance education" in all public schools, and from her office in Boston a most remarkable campaign was conducted for more than twenty years, resulting in enactment of special laws in over thirty states. In the early days of the movement much attention was given by the leaders of temperance instruction to preparing suitable textbooks, securing their adoption, and in other ways carrying out the provisions of the special laws. In recent years there has been a decided decline of attention to the subject. Publishers in New York and Illinois are still careful to include in their new books of physiology and hygiene the required 20 per cent of pages devoted to "temperance"; but numerous teachers in these and other states confess that they never conduct recitations concerning the effects of alcohol and tobacco. This decline of interest is not confined to educators, but even the leading advocates of temperance instruction have shown little public activity in the past decade.

In a few states the original temperance instruction laws have been amended, chiefly by eliminating specifications regarding amount of space in books, number of required lessons, and other details. In New York and Illinois, which have the most extreme legal requirements, the science teachers' associations have worked unsuccessfully for modifications of the laws. (See *Annual Reports*, 1900–1910, of the New York State Science Teachers' Association, and also article by F. L. Charles in the *Nature Study Review*, Dec. 1908, Vol. IV.) Every attempt at amending the laws in adaptation to present educational needs has stirred the advocates of temperance instruction into renewed activity; and fearing that any loosening in temperance legislation may result in unraveling the whole work, they have kept the machinery of their powerful organization ready to oppose any proposed educational reform which affects temperance instruction.

The reasons why temperance instruction as required by the laws has failed to gain a permanent standing among educators are essentially as follows: first, much of the subject matter in the earliest textbooks which had hearty approval by the temperance advocates was decidedly unscientific and sensational. It was unscientific chiefly because it attempted to teach, with detailed application to particular organs, that alcohol and tobacco are even in limited quantities and for all persons physiologically harmful. Science has not yet proved this to be true. It was sensational in that extreme cases of chronic alcoholism and nicotine poisoning were most prominent in lessons on the effect of alcoholic beverages and tobacco. Most of the newest books have taken more scientific ground in presenting only the demonstrated facts, some of which do not point definitely toward total abstinence in use of alcohol and tobacco.

A second reason for the opposition of science teachers to temperance instruction was its overemphasis. All that is positively known concerning the physiological basis of temperance can be printed in very much less than one fifth of the pages of an elementary book on hygiene. Such books for grammar schools average 250 pages, and less than five pages would teach well all that is true and adapted to young pupils.

A third difficulty came from the rigid legal prescriptions regarding place of the temperance teaching in the curricula of schools, the method of teaching from adopted books, and other pedagogical problems. The legal requirements have made impossible some very desirable reorganizations of hygiene teaching in relations to other science studies; and the insistence upon textbooks has done much to make the study of hygiene uninteresting to pupils and unsatisfactory to teachers.

At present there is a widespread feeling among science teachers that the temperance instruction movement has now reached in many states a stage where the teaching required can be brought into line with the improved hygiene. In probably all states except New York and Illinois the temperance teaching can be adjusted in harmony with good nature study and science teaching if books and teachers present briefly and scientifically as the laws allow, the established facts regarding the effect of alcoholic drinks and narcotics upon human health. Probably all science teachers who are well informed concerning physiological investigations will agree that the essential facts of temperance instruction should be included in the hygienic courses in all schools; and this much is now taught in many schools which are not subject to the public school laws. In New York and Illinois there is no possibility of making the most desirable improvements in teaching elementary hygiene so long as the adopted textbooks and official school programs conform with the existing temperance instruction laws. These are very commonly neglected in practice, but they prevent desirable rearrangements of the hygiene and correlations with other science studies.

M. A. B.

See Alcohol, the Use and Psychological Effect of.

Reference: —

Lloyd, F. E., and Bigelow, M. A. *Teaching of Biology in Secondary Schools*, Chap. XIII. (New York, 1907.)

TEMPERATURE OF SCHOOLROOM. — See Air of the Schoolroom; Heating and Ventilation of Schoolroom.

TEMPERATURE SPOTS. — Thermal stimuli excite three different sorts of sense organs in the skin, the temperature spots of warm and cold, and pain spots. Temperatures above the physiological zero point (which shifts about 3° C.) excite warm spots, temperatures below this point excite cold spots. Temperatures of 45° or more also excite the cold spots, and the cold sensations combine with the warm to produce the sensation of heat. Extreme temperatures, below 10° and above 55°, excite the organs of pain in addition to the temperature spots and give the sensations of biting cold or burning heat. See also Warm and Cold Spots. W. B. P.

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TEMPLE, FREDERICK (1821–1902). — Headmaster of Rugby School, and Archbishop of Canterbury, born at Santa Maura in the Ionian Islands, the son of Major Octavius Temple, Lieutenant-Governor of Sierra Leone. When his father settled on his estate in Devonshire, Frederick was sent to Blundell's School, Tiverton, and was to be prepared for the career of a farmer. His abilities, however, attracted attention and before he was seventeen he gained a scholarship to Balliol College, Oxford. Here he graduated in 1842 and was appointed fellow of Balliol and lecturer in logic and mathematics. In 1846 he was ordained, and accepted the position of principal of Kneller

Hall, then opened for the training of masters of workhouse and penal schools. In 1855 he became a government inspector and in 1858 he went to Rugby School as headmaster. At Rugby he soon gained the confidence of the boys and the coöperation of the masters. A rugged exterior and strong will concealed a great deal of sympathy and kindliness of heart. His interest in the outside activities and in athletics, and above all his sense of justice, endeared him to the school. While not a profound classical scholar, he compensated for this by his versatility and wide range of acquirements. As a preacher in the school chapel, he was always impressive, and won his pupils by his strength and earnestness rather than by any emotional appeal. Himself brought up in the classical tradition, he was liberal enough to recognize the value of the new studies, and appointed the first science and mathematical master, Rev. J. M. Wilson, built a laboratory, and instituted scholarships for science. According to the *Report* of the Public Schools Commission, issued in 1864, Rugby was unsurpassed in the teaching of classics, was the only public school to teach physics, and was second only to Harrow in the teaching of history. Dr. Temple devoted much of his time also to the interests of Rugby town, was a member of the Rugby Board of Health, of a Rugby Land Society (a coöperative land purchasing society), and was an active president of the Mechanics' Institute. In 1869 he accepted from Mr. Gladstone, of whose policy he was a supporter, the Bishopric of Exeter, and in 1885 was appointed Bishop of London. He became Archbishop of Canterbury in 1896. Dr. Temple was a strong advocate and ardent supporter of the movement for popular education, for the education of women, and for temperance. He was an active member of the Endowed Schools Commission and was of considerable assistance to Forster in popularizing the Education Bill of 1870. In 1902 almost with his dying breath he again made an appeal for the acceptance of the Education Bill, then before the House of Lords.

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Editor. *Memoirs of Archbishop Temple by Seven Friends.* (London, 1906.)

TEMPLE UNIVERSITY, PHILADELPHIA, PA. — Founded in 1884 by Russell H. Conwell, pastor of the Baptist Temple. In the early years of the institution it performed a notable service in dignifying thorough graded evening instruction and in furnishing an avenue through which those who had not followed the beaten track of educational courses could prepare themselves for higher positions and for greater cultural enjoyment. It was chartered as a college by the State of Pennsylvania in 1888. In 1891 power to confer degrees was granted. In the same year the day school was opened. The Theological School was opened in the fall of 1893; the Law School in 1895; the Pharmacy School in 1901; the Medical School in 1901. In 1907 the Philadelphia Dental College was federated with Temple College, and on Dec. 12, 1907, the charter was amended and the name changed from Temple College to Temple University.

The institution has now seventeen departments with fifty-eight different courses and 225 instructors. The total enrollment of students for 1910–1911 was 3083. Although day instruction is given in most of the departments, it is still the aim of Temple University to adapt the hours of its instruction to the spare hours of its students so long as the work is of such a character as to be done adequately day or evening. The medical and dental departments conduct no evening classes. The same standards of scholarship examinations and other tests are maintained in both day and evening classes, and the requirements for admission and graduation are identical. The university, in the quarter of a century of its history, has reached tens of thousands of persons who could not, under any circumstances, have obtained a higher education from the existing educational institutions.

L. H. C.

TEMPO. — See Musical Notation.

TEMPORAL SIGN. — Temporal sign is that characteristic of an experience which, after the analogous local sign (*q.v.*), marks the position of the experience in the time series. Thus, an experience which passed through consciousness some time ago is relatively dim, while an experience which has just passed through consciousness is clear and vivid. The clearness or dimness of the memory image is directly related to the placing of the image in time.

C. H. J.

See Local Sign.

TEMPORARY ATTENDANCE. — See Attendance; also Records and Reports.

TEMPORARY SCHOOLS. — Frequently known as portable schools, because of the ease with which they may be removed from place to place as need requires. Within the past ten to fifteen years these have been used by many American cities, and have been of much service in affording temporary accommodations for school children. A frame one-story building, usually containing only one regular sized classroom, is erected and equipped with seats, stove, etc. When they first began to be used the cost was only about $800 for a building, but owing to the increased cost of labor and materials the cost is nearer $1300 to $1500 to-day. Such buildings can be erected in a short time, and afford great relief to congested districts, particularly when the increase is due to temporary causes or conditions, and does not warrant the erection of permanent buildings. They are also of much value in providing for the school population in new subdivisions, before permanent schools have been erected, and also during the repair or reconstruction of old buildings. When no longer needed at one place they can easily be moved to another location. E. P. C.

TENNENT, WILLIAM (1673–1746). — Graduated from Trinity College, Dublin, and came to America in 1718. He engaged in the ministry and conducted a school at Neshaminy, Pa., which was known as the "Log College." "The institution, though humble in name, was the nursery in which many ministers of the gospel were trained for eminent usefulness." Tennent's "Log College," organized in 1739, was the beginning of Princeton University (*q.v.*). W. S. M.

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Alexander, A. *Biographical Sketches of the Founder and Principal Alumni of the Log College.* (Philadelphia, 1851.)

TENNESSEE, STATE OF. — Organized as the territory of Tennessee in 1794, and admitted to the Union in 1796 as the sixteenth state. It is located in the South Central division, and has a land area of 41,750 square miles. For administrative purposes the state is divided into ninety-six counties. In 1910 Tennessee had a total population of 2,184,789, and a density of population of 52.4 persons per square mile.

Educational History. — Tennessee was settled from North Carolina in 1756, and its early history is closely linked with that of the parent state. The first school in the state was founded by Samuel Doak, a Scotch-Irish Presbyterian, about 1780, at Salem. A few academies and colleges were chartered during this early period, and in 1817 it was declared that "colleges and academies should form a complete system of education for the state." On the admission of the state in 1796, Tennessee had framed a state constitution, but in this no direct reference to education was made, and practically nothing was done looking toward the establishment of elementary education until 1830.

Though different governors had repeatedly urged action in their messages, it was not until 1830 that the first school law for the state was enacted. This established the district system, and provided for five school trustees for each district; the employment of teachers; county commissioners; for the establishment and supervision of schools; the apportionment of money; and for annual reports, but made no provision for support other than the income from the school fund, donations, fines, and the taxes on the school lands sold. The district trustees were to have power to employ teachers, and to establish their qualifications, and were to try to induce all children under fifteen to attend. No distinctions between rich and poor were to be made, and the schools were to be open and free to all. The county commissioners were to visit and examine the schools each year, and to report to the secretary of state, who in turn was to report to the legislature. For the time and the region the law was very good. Later on this law was improved by the creation of a state board of commissioners to care for the school fund; and by a provision directing the county courts to appoint an officer to examine teachers for the county. This last was the beginning of the county superintendency in the state. In 1835 the secretary of state was made *ex officio* superintendent of public instruction, but in 1844 the state treasurer was designated to act *ex officio* as the head of the school system instead of the secretary of state. The system as thus created continued up to the outbreak of the Civil War.

In 1834 the state adopted a new constitution, and in this the first mention of education appears. The legislature was directed to cherish literature and science and to advance learning, a board of commissioners for the school fund was to be elected by the legislature, and the new common school fund was declared to be a perpetual fund. By the acts of 1837 and 1838 the school fund was made a part of the capital of the newly organized bank of Tennessee, and the bank was ordered to set aside annually, from its surplus, the amount of $18,000 for the support of academies, and $100,000 for the support of common schools. In 1858 the amount of school fund to be invested in the bank of Tennessee was limited to $1,500,000. With the failure of the bank in 1865, the money so invested was lost. Just what kind of schools existed before the Civil War is somewhat uncertain, but that the school system established was lacking in vigor and effectiveness is quite certain. The interest on the school fund was distributed, more or less fully, to the counties, but was so small and so poorly managed that it supported schools but a few weeks each year. With the outbreak of the war the schools were closed, and no further attempt at public education was made until 1867.

This year a new school law was passed, which attempted to organize a state system of public schools. The board of school fund commissioners was continued to look after the school fund, and the office of state superintendent of common schools was created, to be filled biennially by popular election. County superintendents, to be elected by a convention of the district boards, and for three-year terms, were provided for. District boards were to have charge of the high schools, and subdistrict boards of the elementary schools. Teachers were to be examined and paid by the county superintendents. Separate schools for the two races were to be established, free of tuition, and for a five-months' term, and a 2-mill state tax for schools, and district taxation to prolong the term, were provided for. A tax of one fourth cent a mile on all passengers carried on the railways of the state was also to be used to help maintain the schools.

The school system now provided was the best the state had known. The new system, however, seemed to the people one of the intolerable innovations, and the tax for schools, in the impoverished condition of the people, as exceedingly oppressive. Accordingly the legislature of 1869–1870, responding to a demand for economy and county rights, repealed the law of 1867 and gave the state superintendent ninety days to wind up the affairs of his office. Instead of the state school system, now abolished, each county was given permission to establish and maintain schools at its pleasure.

In 1871 the state treasurer was again made *ex officio* superintendent of schools, but as no duties were assigned to him and he had almost no authority, there was little for him to do. The trustees of the Peabody Fund (*q.v.*), however, gave the treasurer money in 1872 for an assistant, to investigate conditions and needs, and to try to awaken interest in schools. His report for 1872 showed that while in some counties quite a local interest in schools existed, in the state as a whole not one fifth of the children of school age were provided with any school facilities whatever. In only twenty-nine out of the ninety-three counties had any school tax been levied, and "in some counties visited there was not a single school, either public or private, in operation, nor were there any efforts being made by the citizens to remedy the deficiency."

The beginning of the present school system dates from 1873, when a new school law, which has continued in existence ever since, was enacted. The office of state superintendent of public instruction was created, with superintendents for the counties. Both were to be filled by appointment, instead of election. The district system was restored. The old school fund of $1,500,000, with accrued and unpaid interest to the amount of $1,012,500, was recognized as a "perpetual obligation" of the state, and a 6 per cent bond to cover the same was ordered issued, the interest to be raised annually by general state taxation. A state poll tax was also added, by the provision of the new constitution of 1870, which also made separate schools for the two races mandatory. A so-called state school tax of one mill, instead of two as in 1867 (in reality a compulsory county tax), was now added on all property, and county courts were ordered to levy additional taxes up to three mills, if necessary, to maintain a five-months' school, or if needed for building purposes. In 1875 the power to levy the county tax was repealed, but later a one and one half mill county tax was restored. Advanced schools, supported by fees, were permitted. In 1875 a state board of education was created and given some supervisory functions, and normal instruction was established for the first time at Nashville by the joint action of the new state board, the Peabody trustees, and the trustees of the University of Nashville. The state made its first appropriation for the institution in 1881, and this school later developed into the Peabody Normal College (*q.v.*).

The system thus created slowly got under headway, but owing to the poverty of the state, the lack of trained teachers, and the inertia arising from the old conditions, progress was necessarily very slow. In 1885 cities were permitted to organize a system of free higher graded common schools, and in 1891 the public school system was declared to consist of two classes of schools, — primary schools of five grades, and secondary schools, consisting of the primary and three additional grades. Women were made eligible for the county superintendency in 1889. With the exception of these additions, the law of 1873 remained almost changed for more than twenty-five years. In 1899 the county high-school law and the state uniform textbook law were enacted. In 1907 a law of fundamental importance was passed, under the provisions of which the old district system (*q.v.*) of school organization was abolished, a county system of school administration (*q.v.*) was substituted, and county boards of education were created. In 1907 the trustees of old colleges and academies were authorized to transfer their property and trusts to the county boards of education for county high schools. In 1909 a state free library commission was created, and provision for school, public, and traveling libraries was made; the first compulsory attendance law was enacted; and a so-called "General Education Bill," setting aside one fourth of the state's gross revenue for education, and providing for its distribution, was enacted. The legislation of 1909 was the most important since the establishment of the school system.

Present System. — At the head of the present school system of Tennessee is an appointed state board of education and a state superintendent of public instruction. The state superintendent is nominated by the governor, confirmed by the senate, and acts *ex officio* as secretary-treasurer of the board, and as a member of it and of all the other state educational bodies. The law requires that he be a person of literary and scientific attainments, and of skill and experience in the art of teaching. The state board of education is charged with the general control of the normal schools; the classification of the high schools, and the determination of their courses of study; the examination of high school teachers; the appointment of a high school inspector; the apportionment of the state aid to high schools; the distribution of the state equalization fund; the distribution of the state library fund, and the issue of lists of desirable books for purchase; the prescribing of rules and regulations for the examination of applicants for the county superintendency; and the making of a report to the governor and the legislature, through its secretary, on the condition of the school system. The state superintendent collects and disseminates statistics and information; sees that the laws and the rules and regulations of the state board are faithfully executed; performs a number of other minor duties, and makes a biennial report to the governor. The governor, the state superintendent, and three members of the state board of education named by the governor, constitute a state textbook commission, which is charged with the adoption of a uniform series of textbooks for the primary and secondary schools of the state.

For each county there is a county board of education and a county superintendent of schools. The county court of each county divides the county into five school districts, for each of which the voters elect, biennially, one member of a county board of education. The county court also appoints the county superintendent of schools for a two-year term and fixes his salary. The state, since 1909, has paid one half the sum granted, but with a maximum state grant of only $350. He must be a person of literary and scientific attainments, and of skill and experience in teaching, and must file with the court, before election, a certificate of qualification, issued by the state board of education. Women are eligible for the office on the same terms as men. The county superintendent acts *ex officio* as secretary of the county board of education; keeps all records; issues all warrants; and makes a written report of the board as to expenditures. He also visits and supervises the schools of his county; acts as agent for the state board of education in the examination of teachers; acts under the direction of the state superintendent; appoints to fill vacancies in the county board of education, or the district advisory boards; and reports to the county board and to the state superintendent of public instruction. Each county board has control of all the schools of the county, outside of cities and towns organized under special charters or laws; selects the teachers for the schools of the county, fixes their salaries, and may dismiss them for cause; erects, repairs, and furnishes schools; manages the school property; controls the expenditures from the public school fund; may locate new schools where and as needed, and may close small and unnecessary schools; is required to run all schools in the county as nearly an equal length of time as possible; may arrange for the attendance of children in other counties; may act on appeals from district boards; and is supposed to visit the schools twice each year. Each member is to report to the county superintendent on the schools of his district. The members of the county board of education thus duplicate the work of the county superintendent, and act, in part, as a board of superintendents for the schools of the county.

For each district into which the county is divided, a district advisory board of three is elected biennially by the voters. The functions of such boards include the visitation of schools and the inspection of school work; the keeping of the school property in repair, and the school supplied with necessities; the taking of an annual school census; and the suspension and dismissal of pupils. They may make general recommendations to the county board, and may also recommend desirable teachers for election. These advisory boards, established in 1897, supplant the many district school boards formerly in existence under the old district system law. Five counties are exempted from the operation of this law, and it also does not apply to city school systems.

School Support. — The " General Education Bill " of 1909 created " a general education fund to improve, extend, and unify the school system of the state," by setting aside 25 per cent of the state's gross revenue for aid to education. This will give a fund of approximately three quarters of a million dollars. By the terms of the bill this is to be distributed as follows: 61 per cent to the counties on the school census; 10 per cent as an equalization fund, to be distributed by the state board of education to counties levying a 4-mill county tax and a $2 poll tax, and directly in proportion to the school census and inversely in proportion to the taxable wealth; 8 per cent for a high school fund and 1 per cent for a library fund, both to be apportioned by the state board of education; 13 per cent for the establishment and maintenance of normal schools; and 7 per cent for aid to the University of Tennessee. State aid for county superintendents' salaries also comes from the equalization fund.

Teachers and Training. — Peabody Normal School (see PEABODY FUND), in connection with the University of Nashville, for a long time rendered most valuable service, not only to Tennessee but also to the whole South. This institution has now been recognized as a college for teachers. In 1909 the state decided to create a series of state normal schools, and provided for the establishment of three for whites and a combined normal and industrial school for colored teachers. The locations of the schools for whites are: East Tennessee Normal School at Johnson City, Middle Tennessee Normal School at Murfreesboro, and West Tennessee Normal School at Memphis. The state employs at present approximately 11,000 teachers, about 18 per cent of whom are in colored schools. Three grades of elementary teachers' certificates are issued by county superintendents. Peabody Normal School diplomas only are accepted instead. A high school teacher's certificate, based on an examination in high school subjects, is also issued by the state board of education, and diplomas from standard four-year colleges may be accepted in place of this examination.

Educational Conditions. — Only about 1 per cent of the total population of the state is foreign born, and about one fifth is of the colored race. There are a few large cities, but the state is still largely rural, and over four fifths of the total population live in rural districts. Primary schools are found everywhere, and district boards may establish secondary schools as needed. Graduates of the secondary schools are admitted to the county high schools. Separate schools are required for the two races, and these must be maintained an approximately equal length of time. Within recent years, the taxation for education, the length of term, the salaries of teachers, and the value of the school property, have all made marked increases. A new educational spirit seems to have taken hold of the state during the past six or seven years.

Secondary Education.—The county courts of each county may provide for the establishment of one or more high schools in the county, and may levy a special tax for them, up to 15 cents. Under the new 1909 state aid law, 8 per cent of the 25 per cent of the state's gross revenue is used for aid to high schools. This is apportioned in the discretion of the state board of education, though not over one fiftieth of the fund can be given to any county, and not over one third of the cost of maintenance of any school can be so paid. A state high school inspector is appointed, and paid from the fund. A county high school board locates the schools, employs the teachers, and manages them, subject to the supervision and rules and regulations of the county and the state superintendent. About one half of the counties had provided such schools by 1910. The cities maintain four-year high schools under other provisions. Seven high schools for colored students are reported in the state.

Higher and Special Education. — The University of Tennessee, at Knoxville (*q.v.*), which dates back to 1794, stands at the head of the school system of the state. This is also the agricultural and mechanical college for the state. Besides the State University, there are a number of other institutions of higher learning in the state, the most important of which are Marysville College (*q.v.*), Vanderbilt University (*q.v.*), and the University of the South (*q.v.*) for white students; and Knoxville College (*q.v.*), Fisk University (*q.v.*), and Walden University (*q.v.*) for the colored race. Besides the State University, there are twenty-seven collegiate institutions for whites, twenty of which are under denominational control, and seven for women only; while twelve institutions, all under denominational control, exist for colored students only.

The state also maintains the Tennessee School for the Blind at Nashville; the Tennessee Deaf and Dumb School at Knoxville; and the Tennessee Industrial (Reform) School at Nashville. Three counties also maintain county industrial and training schools.

E. P. C.

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TENNESSEE, THE UNIVERSITY OF, KNOXVILLE, TENN.

— Originated as Blount College, chartered in 1794 by the "Territory South of the River Ohio." In 1807, the institution was combined with the East Tennessee College, just chartered by the legislature. The purpose of this amalgamation was to give to the new institution the land granted by the legislature to two colleges, one in East and one in Middle Tennessee. So little was realized from these lands that the college was not actually opened until 1820. In 1826 the present site of the university was purchased, a building erected, and a classical college established. In 1840, with widened scope, this became the East Tennessee University, and in 1869 it was made the recipient of the Morrill Act (*q.v.*) fund as the State College of Agricultural and Mechanic Arts. In 1879 the name was changed to The University of Tennessee. Since that time the university has expanded in substantial ways along many of the lines of the usual state university departments, and has become a factor not only as the capstone of the educational system of the state but in its relation to the various interests of the entire South. The summer session, especially, has become an institution for the entire section as "The Summer School of the South."

The colleges of the university are as follows: the Graduate School, the College of Liberal Arts (including the School of Education), the College of Engineering, the College of Agriculture, the College of Law, the College of Medicine (including the School of Pharmacy), the College of Dentistry, the Summer School, and the Industrial departments. The Colleges of Medicine and Dentistry are located at Memphis. The other departments are located at Knoxville.

The College of Liberal Arts requires fourteen units for admission. The requirements vary in other colleges. The attendance in 1911–1912, in the College of Liberal Arts, was 437; in all departments 1541; in the Summer School of the South 2482. The teaching staff numbered 150. Brown Ayres, LL.D., is president.

TENNY, SANBORN (1827–1877). — College professor; was educated in the common schools of New Hampshire and at Amherst College. He was instructor of natural history in the private school at Lancaster, Mass., conducted by William Russell (*q.v.*); professor in Vassar College (1865–1868), and in Williams College (1868–1875). He published textbooks on natural history and geology, and several papers on the educational value of natural history. W. S. M.

TENURE OF TEACHERS. — In some parts of the United States the old practice still prevails of having two terms of school each year, and of employing a different teacher each term. The general practice, however, is to employ teachers by the year, having an annual election and making an annual contract with the teachers. So general is this practice, and so long has it been continued, that it is generally recognized as correct, and in a number of states the law not only sanctions it but also expressly forbids school boards to make any contract with teachers extending beyond the close of the current school year. Such a legal prohibition is partly traceable to a desire to prevent a well-disposed school board from tying up a town or a city to long term or to life contracts, with teachers; in part to a desire to preserve the patronage intact for each new set of school officers to handle; and in part to the traditions of teaching, as a temporary and an itinerant occupation.

The result of such a limitation is that all teachers' positions are practically declared vacant at the end of each school year, and a new election for all the teachers employed is then held. A number of the larger cities have been able to arrange somewhat better conditions of employment, the annual election being a mere formality in the case of all old teachers, and a few other cities have obtained legislative permission to make longer term contracts. These cities form exceptions, however, and even in many of these the conditions are likely to be changed at any time by a new school board, or by some new turn in the wheel of political fortune.

This annual determination involves a great waste of nervous energy on the part of both teachers and school authorities, and is wholly unnecessary from the standpoint of the efficiency of the schools. Business employees the country over are not subjected to such conditions, nor are employees in any other branch of the public service which demands special training or ability. Public school teachers, almost alone of all public employees, must run the yearly chance of being dropped without warning or hearing. Such a condition is not only unnecessary, but it is detrimental to the best interests of the service in which they are engaged, for strong and capable men and women cannot be attracted, under such conditions, to equip themselves by special training for insecure positions. Only in colleges and normal schools is there any general attempt to provide satisfactory tenure for teachers.

In many communities, too, it is customary to delay the election until after the schools have closed and the teachers are in large part gone, and in the smaller towns and the rural communities the election frequently does not take place until late in the summer. This is often defended on the ground that the board can then work with greater freedom. This procedure is wasteful in the extreme, and a drain on the nervous energy of the teachers which would otherwise go to increase the efficiency of their instruction. Frequently the much-needed summer vacation must be postponed until the board has condescended to act and, in the case of the election of some one else, a good portion of the remainder of the summer must be spent in hunting another position for the coming year. As some kind of position is usually an absolute necessity, it is not to be wondered at that we occasionally hear of underbidding and other acts of unprofessional conduct. The wonder is not that such cases occur but that the number is so small. Boards of education and boards of trustees, or at least certain members of such boards, not infrequently assume a somewhat important attitude in their dealings with teachers thus dependent on them, and forget that an old and successful teacher has a claim to considerate treatment. The enthusiasm of teachers for the work is frequently destroyed by such treatment and they embrace the first opportunity to leave the work for service in some other field of endeavor where the conditions of employment are less irksome. This is particularly the case with men teachers.

As a reaction against this condition there is a tendency, in many parts of the United States, to go to the opposite extreme, and to demand life tenure for all teachers. Such a plan has been put into effect in a few cities, and in at least one state. The plan appears to possess certain advantages, and it undoubtedly proves an inspiration at first to a competent and worthy yet timid teacher. Still, notwithstanding any advantages which life tenure may have, it is nevertheless a most undesirable one to adopt. No business could be conducted satisfactorily on such a basis of employment, and even with public employees under civil service rules there is always provision for the elimination of the incompetent. In the work of teaching, where it is so easy to drop behind and die professionally, it is particularly important that the way be left open for the elimination of those who have ceased to grow and who have lost their enthusiasm and ideals. A teacher good at twenty-five or thirty may be comparatively useless at forty-five or fifty. In our desire to improve the conditions of tenure and to protect the worthy teacher, we may easily go to the opposite extreme and forget the interests of the child, for whom alone the school exists. The necessity for an annual reëlection of all teachers ought to be removed, but the way ought always to be left open, without too much effort or too great a burden of proof, for the dismissal of those whom school officers deem no longer competent for the work of instruction. The permanent tenure plan does not afford such relief. It is practically impossible to dismiss teachers where a legal trial must be held and incompetency proved to the satisfaction of a court of law, and it is a matter of common knowledge that in places where life tenure exists both boards and superintendents, after a time, cease to try to dismiss any one, and the efficiency of the schools declines. When charges are brought, it is altogether too often the case that it is the superintendent or principal, and not the teacher, who is really put on trial, and almost any average lawyer can so shape the case that a supreme court will reverse the decision and reinstate the teacher.

The life-tenure plan is objectionable, further, in that it tends to develop a self-satisfied and an unprofessional body of teachers. The plan would not be so bad if all entering the work were carefully trained and selected, and if the teachers were in a state service, as in Germany, instead of in the service of individual localities. There the inefficient are transferred to smaller places, or even to remote regions, while the efficient are selected to fill the best positions in the state. Because of this fundamental difference no argument from the life-tenure system of Germany is valid here. We have no state school service, ours being entirely local. But even in Germany a teacher may be dismissed for immorality or incompetence, as is occasionally done.

Between annual election and life tenure there is a middle ground which may be taken with propriety, and the enactment of which into law would be an act of justice. A teacher who has rendered faithful service and is competent ought not to be compelled to ask for reëlection. Continuance in service ought to be assumed as a matter of course, and no official action, even though it be a formality ought to be necessary to secure this. The whole burden of reëlection now rests on the teacher, when the whole burden of dismissal ought to rest on the board. The teacher's continuance in office ought to be assumed, unless the board is willing to take the responsibility of notifying the teacher in writing, with reasons, that the board desires to terminate the contract at the close of any school year. If the board is willing to take this responsibility, and deems it wise to make a change, it clearly ought to have the right to do so, if it is done in a proper manner and before a certain set time. The board, too, should have the power to decide as to the sufficiency of the reasons for terminating the contract, and without other appeal than to the people of the community. Courts of law, certainly, should not be allowed to pass on the sufficiency of the reasons. The board, however, ought to be required to give such notice sufficiently early, as not later than the last day the schools are in session, or by the fifteenth day of June, in any case, and not allowed to wait until the teacher has left town.

Such a change would shift the burden of a continuance of employment from the teacher to the board, where it should rest, and would practically give life tenure to every competent and worthy teacher, at the same time leaving every school board free to discontinue the services of incompetent, unprogressive, and unworthy teachers. The appeal from the decision, both for the board and for the teacher, would be to the public of the community. Such a change in the school laws of the different states would practically solve the difficulties now met with all over the country, without inflicting life tenure on any community. Such a proposal would naturally meet with the opposition of many school boards, because it would compel them to justify their actions more fully than they now need to do, and it probably would be opposed by some teachers now living under life tenure, because it would demand keeping alive and efficient as a condition of retention. By no means one of the least of the benefits to be derived from the operation of such a law would be the clear declaration of vacancies which would be made each year, and the possibility of defining unprofessional conduct more clearly than can now be done. E. P. C.

England. — The tenure of elementary school teachers in England is *de facto* permanent, for, although they may be dismissed, this measure is only reserved for extreme cases of incompetence or for misconduct. So far as possible other measures, *e.g.* caution, reprimand, or transfer may be resorted to. Where dismissal practically means professional ruin, a teacher is not infrequently given an opportunity to resign. Teachers in council schools can only be dismissed by the local authority on the recommendation of a principal or local manager. Teachers in voluntary or non-provided schools may be dismissed by the local authority for educational incompetence and by the managers on grounds connected with the giving of religious instruction. All summary dismissals must be reported to the board of education, which may inform the teachers of the charge against them and give them an opportunity to offer an explanation.

Until 1908 assistant masters in secondary (endowed) schools held their office from the headmaster by whom they were appointed, and they could be dismissed with or without notice or redress. Frequently a newly appointed headmaster would dismiss part or all the staff in order to recruit masters more to his liking (Richmond Case). Since 1908, however, by the Endowed Schools (Masters) Act, assistant masters can only be dismissed by the governing body of a school directly or through an agent. This puts them in the position of servants of the governing body. The headmaster, however, has still the predominating voice, but the governing body is legally responsible, and full and proper legal notice is necessary for dismissal. The practice of municipal secondary schools is similar to that in endowed schools. The tenure of assistants in private schools, however, is still as precarious as ever.

For tenure in Germany and other countries, see articles on those countries. Also Pensions, Teachers'; *Teachers, Improvement of, in Service,* under Teachers, Training of.

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TERM. — The element of logical or reflective knowledge as stated in a proposition: equivalent, in one logical terminology, to the meaning or concept; in another, to the verbal form in which the logical meaning is expressed. The chief distinctions among terms were formulated by Aristotle and by the Scholastics who wrought out the terminology of formal logic. Some of the more important distinctions are positive, negative, and privative; singular, universal, and particular, and denotative and connotative. The denotative function of a term is the reference it makes to existences. Directly or indirectly, a logical meaning intends to apply to, to refer to, concrete existence. Terms that particularly perform this office point to, designate, denote. The connotation of a term, on the other hand, is the attributes or meanings which it implies. Division and classification are correlative to denotation; definition and generalization to connotation. Closely related distinctions are the use of terms in extension and in intension. The extension of a term is the species covered by the scope of the term, as the different kinds of vessels for navigation included within the scope of the term " ship "; its intension is the assemblage of properties necessary to define the meaning of " ship."

More important perhaps, for educational purposes, than these formal distinctions is that between popular and technical terms, which are the pedagogical equivalent for concrete and abstract terms. By seeing things used, by participating in their use, by engaging in conversation, every one gathers, from the broader context of use, a certain number of meanings. These constitute the popular (or, as they are sometimes called, psychological) terms of thought. In science, these meanings are wrought over, elements are excluded and added, with reference to the meaning of a term as one element in a logical system. This process gives technical terms. It is a long road from the popular meanings of triangle, water, metal, to the respective mathematical, physical, and chemical meanings. A large part of a wise skill in instruction consists in the proper gradation or modulation of transitions of this nature. J. D.

See System.

TERM, SCHOOL. — Used for some subdivision of a school year, as fall term, winter term, spring term, and summer term. A summer term and a winter term were once common divisions of the school year in New England, the summer term being commonly taught by a woman and attended chiefly by girls, and the winter term being taught by a man and attended by both boys and girls. Two terms a year are still " taught " in the school districts in some of our states, one in the fall, and one in the winter or spring, and different teachers are not infrequently employed for the two terms, though an earnest effort to stop this practice has been made in nearly every state. City school systems commonly have two terms, or half years, so arranged for convenience in outlining the course of study and in making promotions, but usually continuous as to time. Many normal schools and some colleges divide the school year into three terms, and a few add a fourth, or summer term.

As applied to public school work, the word term also means the length of the yearly session, as a school term of nine months or one hundred and eighty days. All of the American states keep records in this manner. On examination these state records show much variation, though with a constant lengthening of the term in most of the states and so far as the United States as a whole is concerned. Seventy-five years ago, a three-months term was a common length, though many cities provided twice this amount. To-day we rather expect a six-months term in the rural schools and a nine- to ten-months term in the cities. In many states no statistics of any value are available for earlier than about 1840 or 1850, and the National Bureau of Education begins its statistics for the year 1870–1871. By decades and by groups of states the national statistics show the following term lengths, in days: —

	1870–1871	1879–1880	1889–1890	1899–1900	1909–1910
United States . .	132.1	130.3	134.7	144.3	155.3
N. Atl. Div. . . .	152.0	159.2	166.6	177.5	179.0
S. Atl. Div. . . .	97.4	92.4	99.9	112.1	138.6
S. Cent. Div. . .	91.6	79.2	88.2	99.8	123.3
N. Cent. Div. . .	133.9	139.8	148.0	155.9	164.7
West. Div. . . .	119.2	129.2	135.0	141.5	161.2

Taking the returns as to length of school term provided by the different states in 1909–1910, and grouping them, we find: —

In 1 state, a term of 100 days
In 1 state, a term of 102 days
In 3 states, a term of 105 to 107 days
In 1 state, a term of 117 days
In 3 states, a term of 123 to 130 days
In 6 states, a term of 131 to 139 days
In 8 states, a term of 140 to 149 days
In 3 states, a term of 155 to 159 days
In 5 states, a term of 160 to 169 days
In 8 states, a term of 170 to 174 days
In 9 states, a term of 180 to 188 days
In 1 state, a term of 193 days

The extremes are New Mexico and North Carolina with 100 and 102 days, and Rhode Island with 193 days. If we omit the 6 states having less than 120 days, and the 9 states having more than 180 days, as extremes, also, we find that the remaining 35 states still vary from 123 to 174 days.

Each state also prescribes a minimum term supposed to be allowed under the school law, though in a number of states there are quite a number of small rural districts which fail to meet the minimum requirements of the state, because of insufficient funds. Grouping these minimum legislative requirements as to term, we get: —

6 states have no legal minimum term
4 states require a term of 60 days
5 states require a term of 80 days
9 states require a term of 100 days
11 states require a term of 120 days
4 states require a term of 140 days
5 states require a term of 160 days
3 states require a term of 180 days
1 state requires a term of 200 days

Thus one third of the states require a term of eighty days, or less; one half of the states require a term of from 100 to 140 days; and one fifth require a term of 160 days or more.

E. P. C.

England. — According to the elementary school code, an elementary school to qualify for the government grant must have met not less than 400 times in the school year. Local authorities have the power to determine the number of times in excess of 400 on which a school shall be open. There are as a rule two meetings on each of the five school days of the week. "No attendance of any scholar may be counted for the grant unless he has received at least one and a half hours of secular instruction in the case of a school, division, or class for infants, or two hours in the case of a school, division, or class for older scholars, in each case exclusive of the necessary recreation" (Elementary School Code). This practically gives a minimum of 200 days school term and of 1600 hours secular instruction.

Germany. — In Prussia the regulations recognize about 70 days as holidays through the year. For the rest of the time the elementary schools must be open. Sessions may be held in the morning and afternoon or in the morning only. Excluding Saturdays and Sundays, the resulting school term consists here too of 200 days.

TERMINOLOGY. — The technical nomenclature relating to any subject. The development of a nomenclature is an essential factor in the development of any science, since upon it depends accuracy in the expression of thought. Such a nomenclature education has hitherto lacked; and because of the facts that the field deals with human experience in most varied forms, and employs, for the most part, words of the ordinary nontechnical vocabulary to express and describe its phenomena, the development of a nomenclature has been very slow. The processes, activities, and ideas of education are for the most part the phenomena of everyday life; consequently the terms employed in discussing educational problems are terms in common and current use, which, however, as the subject develops, may also acquire a technical significance. Thus the confusion is greatest when the conclusions of the science of psychology are applied to educational topics, since psychology has developed a more extensive terminology along technical lines. Use and custom alone will give value to technical terms. At present few terms are current in education with a definite and exact meaning, and but few that have not several meanings. One of the chief aims of the present work is to assist in developing and fixing such a nomenclature. A variety of terms most closely related to the study of education are considered under PEDAGOGY.

TERTULLIAN, QUINTUS SEPTIMIUS FLORENS (*c.* 150–220 A.D.). — The first of the great Latin Fathers and the originator of Latin theology, stands out more distinctly than any other figure in the early Christian Church. Born at Carthage, he became learned in Greek and Roman literature, philosophy, and jurisprudence, and attained distinction as a lawyer. Upon his conversion, he abandoned this profession and was ordained to the Christian priesthood. He broke with his intellectual past and assumed that attitude of irreconcilable opposition towards Greek philosophy and Roman culture which became the traditional position of the Latin Fathers. After a time he embraced the Montanist heresy and became its chief exponent. He lives chiefly in his writings, which are apologetic, polemic, dogmatic, moral, and ascetic. They are fresh, original, and full of fiery energy. From his pages may be gleaned much valuable information as to heathen practices and the doctrine and worship of the early Christian Church. The best known of his works is the *Apology*, a vindication of Christianity against the attacks of the heathen world. In his *Prescription of Heretics* and other books he combated the strange notions of the Gnostics (*q.v.*). The most original and acute of all are his treatises on *The Soul* and *The Witness of the Soul to God*, in which he discusses the nature and origin of the human soul and enunciates the Traducian theory that it originates at the same moment as the body.

W. R.

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TESTIMONY. — See Evidence; also Demonstration; Proof; Truth.

TESTS. — Tests which purport to measure the efficiency of the work done in schools have always been used. Systems of examinations (*q.v.*) have determined not only the advancement of the individual pupil in our educational system, but the result of these tests has at times been used as a measure of the teacher's efficiency and to determine the amount of public support to be given to a particular school or school system. Improvement in this field has been brought about by refining the methods employed in such tests or examinations. It is very recently, however, that there has been any scientific attack on the problem, and in only two or three subjects may we claim as yet to have the means wherewith to measure satisfactorily the results of instruction given in our schools.

Tests of Efficiency of Administration. — The efficiency of a school or system of schools is to be measured not simply by the results achieved in habit, knowledge, or appreciation upon the part of children, but also in terms of business administration and with respect to the organization and administration of the more strictly educational aspect of the system. It may, of course, be claimed that any sort of business or educational administration is satisfactory just in proportion as it produces results in bringing about those changes which we desire in children. On the other hand, however, we have to consider education as only one of the many functions which an organized society has to perform for the good of the whole group. The amount of money which is available for education in any community is limited by the necessity for providing for other common needs. The problems of business administration in education may, therefore, be of very great significance, since efficiency in this field may determine in considerable measure the possibility of advance in the more strictly educational aspect of the work.

The problems of organization and administration on the educational side are not less significant. The adaptation of schools to the greatly varying groups of children who are to be educated; the provisions for suitable courses of study, books, and other equipment; the schemes for organizing children in groups so as to bring about the best working conditions for pupils and teachers, may not be left out of consideration in any attempt to test the efficiency of our schools. In this discussion of tests, the measuring of efficiency with respect to business administration, the organization and supervision of our schools, and the educational products or measurement of the achievements of individual pupils, classes, or schools, will be treated in order.

Any inquiry concerning the efficiency of schools from the standpoint of business administration leads at once to a consideration of the cost of education, and of each particular part or element of the whole. It is possible that a school system is inefficient because not enough money is spent to secure properly trained teachers or to build and equip suitable schoolhouses. Even where a sufficient amount of money is available, the distribution of this sum among the several items of the budget may operate to curtail or render inefficient some particular aspect of the whole educational system. While it is not possible in this field to establish absolute standards, it is probable that a comparative study of general municipal and city school expenditures will throw much light upon any individual situation. An efficient administration of schools will locate buildings with reference to growth or changes in population. In the erection of schoolhouses, the problem of cost in relation to standards of lighting, heating, ventilating, floor space, and probable life must be considered. Through the standardization and careful inspection of equipment and supplies, school systems have been known to save thousands, or even hundreds of thousands, of dollars. It is clear that business administration may have much to do with determining the efficiency of schools.

From the standpoint of organization and administration of education, we may test schools with respect to attendance, classification and progress, the determination of physical, mental, or moral capacity of children, and the results secured from special types of schools or other special educational activity. We have begun to realize that a fundamental consideration in education is to be found in the measure of our success in keeping all children of school age in our schools. In a few of our cities an attempt has been made to have a continuing census which will enable the school authorities to locate every child of school age, and to bring about an adequate enforcement of the compulsory education law. We are beginning to study the problem of attendance in relation to the proficiency of pupils; to measure the effect of part-time classes; and to be proud of the results achieved by vacation schools or organization of school systems on the four-quarter basis.

In recent years much has been written concerning retardation, acceleration, and elimination of pupils (*q.v.*). It may be that a test of the efficiency of any particular school system, as compared with any other, is to be found in the relative amount of elimination, of retardation, or of acceleration. It seems to the writer that the percentage of children retained for each successive age is a rough measure of the efficiency of a school system, since it measures the amount of education which children have an opportunity to receive. Of course, this test needs to be checked by taking into consideration the percentages of children to be found in each successive grade or year of school work, since we have here a measure of the amount of work actually covered. There may be some doubt as to the validity of a comparison among school systems based upon percentages of retardation, since the standards of promotion are undoubtedly variable. On the other hand, it may be claimed that any organization which permits a large percentage of retardation is inefficient by virtue of this fact, regardless of the standard which may be maintained.

We have as yet little definite information with respect to the results achieved through special methods of classification and promotion. More has been accomplished with respect to determining the relative capacity of children, physical, mental, or moral, with a corresponding development of classes to provide for those who vary from the normal. Through the application of psychological tests, and by means of medical inspection, children who have needed special care have been segregated, and have had provided for them the type of work and the conditions under which their achievements have been greatly increased. Schools for exceptionally capable children have resulted not only in a higher grade of work, but in the actual shortening of the school course for these children in a few of our cities. It is only as these measures of administrative efficiency are further developed and refined that we may hope to test the work of those charged with the administration of our schools.

Tests of Results of Instruction. — Tests of the abilities of children in school subjects have heretofore been inadequate. This fact has been due to the prevailing method of setting tests or examinations. Quite commonly a series of ten or twenty questions have been placed before children, and later credit has been given for each problem upon the basis of calling each answer worth one tenth or one twentieth of the whole credit assigned. It is apparent that there is in such a method no adequate comparison possible as among the children taking the test. It will never happen that each problem is actually as difficult as each other. In most examinations there are questions put that are two or three times as hard as other questions, for which equal credit is given. This difficulty can be met by a preliminary test given to a large number of children, which would discover the relative difficulty of the problems assigned. This would involve the weighting of the questions given in the examination. If the relative ability of children is to be discovered, it will be necessary also to give an examination somewhat longer than can be completed by the bright members of the class in the time assigned. If all of the members of the class completed all of the problems in the time assigned for the test, there is no possibility of discovering from such an examination the relative merits of individual children.

A further refinement in our methods of testing will be brought about when we have derived scales or units of measurement for each subject. When such " measuring sticks " are available, we will be able to say that the quality of work done by any individual, as compared with any other individual, is as indicated by the position on the scale which the work of each deserves. Such scales have been derived in handwriting by Professor Thorndike, in English composition by Professor Hillegas, and in some phases of arithmetic by Mr. Courtis. In general, the method of derivation of such a scale is to take samples of work done, and to grade them in order of excellence. This grading is done by a large number of judges who are especially qualified to judge of merit in the particular field for which the scale is prepared. When two samples are different enough from each other to be noticed by 75 per cent of the judges, the sample considered better by 75 per cent and of equal or less value by 25 per cent of those judging, may be safely considered as one unit better than the sample with which it is compared. It would be possible, in like manner, to discover other units in which the differences would be greater or less. In a similar fashion it is possible through the judgment of those who are expert, to determine the zero point, or that particular product which has no merit.

With the derivation of scales for measuring the achievement of pupils, and with the development of standards in business administration and in organization, it will be possible to test adequately the efficiency of a school or system of schools. When such a system of tests and standards has been derived in all fields, there will be no excuse for the objection to examinations or tests, which one hears so commonly now, because of their inadequacy or unfairness. It is to be expected too that the efficiency of our schools will be greatly increased by the application of such measures.

G. D. S.

See Examinations; Mental Measurement; Psychological Tests; Retardation and Elimination of Pupils; School Management; Supervision of Teaching.

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TESTS FOR COLOR BLINDNESS. — See Holmgren, and Nagel.

TESTS, PSYCHOLOGICAL. — See Mental Measurement; Practice Curve; Psychological Experiments; Psychological Tests.

TEXAS CHRISTIAN UNIVERSITY, FORT WORTH, TEX. — A coeducational institution chartered in 1874 as the Add-Ran College and purchased in 1889 for the Christian Church of Texas, the present name being adopted in 1902. The University was finally moved to Fort Worth in 1910. An academy, and colleges of arts and science, Bible, business, medical college, and fine arts are maintained. The entrance requirements to the college, which confers the degrees of A.B. and A.M., are fourteen units. The enrollment of collegiate students in 1911–1912 was 331. The faculty consists of twenty-four members.

TEXAS, STATE OF. — Seceded from Mexico in 1836; established its independence, and was admitted to the American Union as the twenty-eighth state in 1845. It is located in the south central division, and has a land area of 262,290 square miles. In size it is the largest state in the Union, being over four times as large as the six New England states combined and about the same size as the Austro-Hungarian Empire. For administrative purposes the state is divided into 246 organized counties, and these in turn into independent and common school districts. In 1910 Texas had a total population of 3,896,542, and a density of population of 14.8 persons per square mile.

Educational History. — The constitution of the Mexican state, known as Coahuila and Texas, provided for the establishment of Mexican schools, for instruction in reading, writing, arithmetic, the catechism, the constitution, and morals and ordered the Congress to provide a plan and laws for a uniform system of education for the state. An American type of school was organized in 1828 under Spanish supervision, and in 1829 the Mexican government provided for Lancasterian tuition in several schools. The schools provided, however, were inadequate and unsatisfactory, and in 1832 the American residents held a meeting and addressed a memorial to the governor and the legislature, urging the creation of a fund, by land grants, for the encouragement of primary schools in Texas. Perhaps as a result of this the Mexican state, in 1833, made a grant of four leagues of land (17,713 acres) for the support of primary schools, in the Department of Nacogdoches, and created boards to look after the fund, establish schools, and employ teachers. Little progress was made, however, there being but three schools in all Texas in 1834. One of the grievances against Mexico mentioned in the declaration of independence was the failure of the Mexican government to establish any system of public education.

The constitution of the new Republic of Texas made it the " duty of Congress, as soon as circumstances will permit, to provide by law a general system of education," and a small number of schools was soon opened. The chartering of academies and colleges was begun early, a number of charters being granted by the legislature in 1837 and in subsequent years up to and after the Civil War. Many of these institutions rendered valuable service in providing educational advantages before the state school system got under way. In 1839 the first of the land grants was made, when three leagues (13,284 acres) of land was granted to each county for a primary school or academy in the county, and fifty leagues (221,400 acres) for the establishment and endowment of two colleges or universities, one in the eastern and one in the western part of the state. The latter is the beginning of the endowment of the State University. In 1840 the land grants to counties were increased to four leagues (17,712 acres) each, and it was provided that this should be divided so that one half should be used for the endowment of an academy, and one half should be distributed among the common school districts of the county. The various county school funds owe their origin to this legislation.

In 1845, when Texas entered the American Union, a second state constitution was framed. This made it the duty of the legislature "to make suitable provisions for the support and maintenance of public schools," and to establish a free school system throughout the state. It also permitted taxation for education and made it the duty of the legislature to set apart one tenth of the annual revenue of the state for the support of free public schools. All grants of land previously made for education were approved.

It was not until 1854 that a regular school system for the state was provided for by law, the first school being opened in San Antonio. The chief justice and the county commissioners of each county were constituted *ex officio* a county board of education, with power to subdivide the county into suitable school districts and to call elections for three school trustees for each district, who were to manage the schools. The state treasurer was made *ex officio* superintendent of common schools, and he was to apportion the school moneys to the districts, on a per capita basis. Of $10,000,000 received from the federal government, $2,000,000 was put into the school fund, to produce 5 per cent income. A rate bill was in use, and the one tenth of the state revenue was used largely to provide free schooling for poor children. In 1856 the law was amended to require that all schools must be taught in the English language. In 1858 the county courts were authorized to appoint boards of examiners for teachers, and the trustee system was abolished, the schools being placed under the control of the county boards of education. Just what schools were established under these laws or how much was accomplished is not known, though relatively little seems to have been done until after the Civil War and the reconstruction period. In 1861 but twelve of the 124 counties then organized made the reports required by law, and no summary or statistics were compiled or published. During the Civil War the schools were suspended.

In 1854 the state laid the foundation of the present large state school fund. On entering the American Union the state had expressly reserved to itself the large public domain. By an act appropriating land for railway grants, and a later act of 1856 extending the same provisions for river and other improvement and development projects, it was provided that each alternate section of land should be given to the school fund. In 1856, 400,000 acres were set aside as an endowment for a lunatic asylum, a deaf and dumb asylum (established in 1855), a blind asylum (established in 1856), and an orphan asylum (established in 1887). In 1858 one section out of every ten sections reserved for railroads was also set aside as an endowment fund for the proposed state university. Up to 1910 this grant had produced approximately 44,000,000 acres for the common school fund, and would have produced 3,800,000 acres for the university fund. The university, however, was deprived of all but 1,000,000 acres in 1876, the remainder being given to the common school fund. In 1883, in partial restitution, 1,000,000 acres was granted to the university. Four leagues (17,712 acres) of land were also reserved for each unorganized county. In 1858 the university land grants made by the Republic of Texas (50 leagues) were confirmed, and the idea of establishing two universities was definitely abandoned.

With the secession in 1861, the constitution of 1845 was changed to meet the new conditions, and reënacted. The war engrossed the interest of the public, however, and nothing was done in the matter of schools. In 1866 a new constitution was adopted, which provided for a stronger state school system than had before existed. A state board of education and a state superintendent of public instruction were provided for. The previous legislative grants of alternate sections to the school fund, and of land for asylums and special institutions, were now approved by the constitution, and the legislature was ordered, in addition, to give one half of the future proceeds of all public lands to the common school fund. The county school lands were now placed under the control of the state. A tax for schools was authorized, and each race was to pay for its own schools. The state school fund was to be used for the education of white children only. The legislature was also directed to proceed to the organization of a State University "at an early day." The period of state reorganization under the direction of President Johnson was too brief, however, to permit of the reorganization of the educational system.

The "reconstruction period" now followed, and a reconstruction constitution was adopted in 1869. This reaffirmed the clause in the 1866 constitution regarding the school fund, except as to its use for the education of white children only. It added, further, that the whole income from the sale of public lands, instead of one half, should henceforth be added to the permanent school fund, and also directed that one fourth of the annual state revenue derived from taxation, together with a state poll tax of one dollar, should now be used for the benefit of public schools. Separate free schools for the two races were made mandatory. Otherwise the provisions of the constitution of 1866 were retained. An act of 1871 reorganized the system, and provided for a highly centralized form of state school administration. The reconstruction period ended in 1873, when a new law was passed which abolished the system then existing. This law was adopted over the governor's veto. In 1875 cities were permitted to organize themselves as special school districts for school purposes. In 1876 a new constitution was adopted and a new school law enacted, and this marks the real beginning of public education in the state.

The constitution of 1876 confirmed all previous grants of land for educational purposes, except that only one half of the remaining public domain, instead of all, as provided for by the constitution of 1869, was to go to the school fund. Sectarian instruction was forbidden ; the counties were given back the control and sale of their lands; and an *ex officio* state board of education was provided for, and given the duties of a state superintendent, whose office was virtually abolished. The state superintendent was now elected secretary of the state board of education, and has been so continued by law. There seems to have been little interest taken in the school system before about 1879, and as a means of securing the establishment of schools in the counties the so-called "community system" was tentatively established in 1876. This was a form of voluntary yearly organization, for the purposes of maintaining a school. This for a time rendered good service, but was gradually abandoned, and finally abolished by law in 1909. The Agricultural and Mechanical College was opened in 1876, and the State University was finally organized at Austin in 1883. This same year a legislative grant of 1,000,000 additional acres of public land was made to the University, by way of restitution, but the bill could not be passed until a grant of 2,000,000 acres for the common school fund was also added.

In 1883 an amendment to the constitution was adopted. This approved all previous land grants for educational purposes, and the one fourth of the state revenue provision, and also provided for a state school tax, up to twenty cents, to insure a six months' school generally, and for district taxation. The state superintendency was now revived, and established the next year. A new school law was also adopted in 1884. Summer normal schools, established much earlier by the Peabody fund (*q.v.*), were given their first state appropriation in 1883. Between about 1885 and 1895 the state experienced financial difficulties, the income from the school lands greatly decreased, a deficit in the school fund was created, and educational progress was small. To meet these conditions, the legislature of 1891 proposed an amended section of the constitution (the so-called Jester amendment) to the people, providing for the permissive transfer annually of 1 per cent of the value of the permanent school fund to the fund for annual maintenance. This was approved by the people in 1892. Joint school districts were also first authorized in 1893; approximately equal terms for white and black schools ordered; uniform examinations for teachers' certificates provided; and one half of the "community" counties transferred to the district system. In 1897, 100,000 acres of public land was set aside as an endowment for the colored branch of the University. In 1899 it was provided that all lands heretofore or hereafter recovered from railway corporations should go to the common school fund (this added about 3,000,000 acres); the unwise Jester 1 per cent law was repealed; and a number of minor changes were made in the school law.

In 1905 the school laws were recodified and revised, and during this and the following years much new legislation was enacted, resulting in the following organizations.

The most important of the school legislation enacted in 1911 was the rural high school law, providing for the establishment of high schools in common school districts, and granting state aid to schools establishing instruction in agriculture, manual training, and domestic economy; and the creation of county boards of education to have charge of the high schools and other educational matters. A new certification law, making certification "uniform" throughout the state, and building each certificate on what had gone before, was also enacted; and a constitutional amendment, to permit of terms longer than two years for school officers, was proposed to the people.

Present School System. — An *ex officio* state board of education, consisting of the governor, the secretary of state, and the comptroller, exercises a few functions, such as the hearing of appeals from the decisions of the state superintendent, the investment of the permanent school fund, and the annual apportionment of the available school fund.

The state superintendent, who is elected by popular vote every two years, is charged with the administration of the school laws and with the general supervision of the schools of the state; is to visit the schools, institutions, and associations; hears and determines all appeal cases, with final appeal to the state board of education; examines and approves reports of all subordinate school officers, and audits reports of depositories of school funds of the counties, cities, and towns, independent school districts, and common school districts. He makes a biennial report to the governor and the state legislature with respect to school conditions, and makes recommendations concerning needed school legislation. He also appoints a state board of examiners to grade papers of applicants for state certificates; to assist in making out uniform questions for regular county examinations from which state and county certificates are issued; and to pass upon and recommend to the state superintendent of public instruction the approval of colleges and universities of the first class for the issuance of teachers' certificates upon work done therein. The state textbook board, of which the state superintendent is *ex officio* a member, selects uniform textbooks for use in all public free schools of the state, both elementary schools and high schools.

All counties having a school census (seven to seventeen years) of 3000 or over must establish the office of county superintendent of public instruction, and any county having a smaller number of children may vote to do so. One hundred and fourteen of the 246 organized counties had such an official in 1910, and 81 per cent of the school children were in these 114 counties. Where the office of county superintendent has not been established, the county judge acts *ex officio* as county superintendent.

The county superintendent has supervisory authority over the schools of all districts in his county, except those of independent districts of more than 500 scholastics. He approves all contracts of teachers and all other contracts for the expenditure of the funds of schools under his supervision, and all the warrants drawn against the school funds. He receives, examines, and files teachers' monthly and term reports, including teachers' registers. Acting with the county board of education, he apportions the state and county available school funds among the districts under his supervision, upon the basis of scholastic enumeration, and apportions the funds to the schools of any district in which the local trustees fail to agree as to the division of the same. He makes an annual report of the school affairs of his county to the state superintendent of public instruction. In coöperation with the county board of education, he adopts a uniform course of study for the schools of the county. He serves as secretary and executive officer of the board; supervises the taking of the scholastic census of his county, and makes and forwards to the state department of education annually a consolidated census roll of the pupils of scholastic age. He hears and passes upon appeals from the actions of local school trustees; and appoints a county board of examiners, consisting of two teachers, which holds county examinations for the issuance of county and state certificates. He issues county second-grade certificates. He is required to spend four days of each week when the schools are in session among the schools of his county, and to deliver addresses to students, teachers, and patrons on questions of general or special school improvement. He initiates school reforms, encourages local taxes, advocates the erection of modern school buildings, and otherwise looks after the general interests of the schools of his county.

The board of education of each county is vested by law with the authority to classify the schools of the common school districts into primary schools, intermediate schools, and high schools, and to limit the instruction in a particular school to the classification given. In coöperation with the county superintendent, the county board of education prescribes a uniform course of study for the schools of the county, in conformity to the law and the requirements of the state superintendent of public instruction. The law further vests the county board of education with authority to consolidate two or more school districts for the purpose of establishing rural high schools wherever such consolidation is practicable. Where the establishment of high schools by consolidation is impracticable, it is the duty of the county board of education to provide for the free tuition of eligible high school pupils residing in districts in which high schools are not maintained in the high schools of adjacent or convenient districts. The commissioners' court of the county divides the county outside of independent districts and cities and towns into a sufficient number of school districts, ordinarily of not less than sixteen square miles and in no case less than nine square miles, and is vested with authority to change the district lines as conditions demand. For each of the common school districts, the law provides for the election of three trustees to manage and control the school or schools of the district, any vacancy in the board of school trustees of the district being filled by appointment by the county superintendent. This board of school trustees has control of the school property and the management of the schools, subject to the supervision and instruction of the state and county superintendents. They may employ and dismiss teachers, and make contracts with them, subject to the approval of the county superintendent; determine how many schools are to be maintained in the district, and where; and issue all warrants on the treasurer for the payment of salaries and bills. Any district may vote on the question of levying a special district tax for maintenance in any amount up to 50 cents on the $100, and after two years may hold another election to consider the increase, decrease, or abrogation of the tax. Similar elections may be called for voting bonds for building purposes and for levying a tax for such purposes not exceeding 25 cents on the $100, provided that the rate of the bond tax and the maintenance tax combined shall not exceed 50 cents on the $100 during any year. In districts levying a district tax, the school age and attendance limits (seven to seventeen) may be extended in either direction, and the term may be extended beyond the required six months.

Any town or village having a population of 200 or more may, upon petition to the county judge, hold an election to determine whether or not it will be incorporated as an independent school district for school purposes only, a majority vote of the qualified voters of the district, voting at an election, being sufficient to incorporate the district. Any city or town may assume exclusive control of its schools by a special act of the legislature, or by a majority vote of the qualified voters of such city or town. The schools of independent districts and cities and towns are governed in their administration by the general laws applicable to independent districts, except in cases where special powers have been granted by the legislature in charter or special act. All independent school districts having more than

150 scholastics receive their state apportionment of available school funds directly from the state department of education; and all such districts having a scholastic population of 500 or more report directly to the state superintendent of public instruction. The management and control of the schools of all independent districts is vested in the board of school trustees, consisting of seven members.

School Support. — The various acts reserving lands for educational endowments have succeeded in creating a permanent state school fund estimated at $70,837,505 in 1910, and county permanent school funds estimated the same year at $11,136,396. The state school fund produced an income of $2.17 for each child of school census age in 1910. The county funds produced, on an average, 46 cents per child, but these are very uneven over the state, some counties securing good amounts from their county funds, and others very little. The state levies a state property tax of 16⅔ cents, and this produced $3,160,000 in 1910, or $3.45 per census child. Half of the cost of the schools was paid by state funds, distributed to the counties and districts on the sole basis of school census. Five per cent of cost of the schools came from poll taxes, and 31 per cent from local or district taxation. Tuition fees and subscriptions produced 1 per cent additional.

Teachers and Training. — The state employed 21,277 teachers in 1910, of whom 15 per cent were colored teachers. Of the total number, 7 per cent were graduates of a college, 17 per cent of a high school, 7 per cent of a state normal school, and 5 per cent of some other form of normal school, a total of 36 per cent. Sixty-five per cent of the teachers taught in rural schools. The questions for the examinations are uniform throughout the state. Each certificate is part of a graded series, and teachers are permitted to build from one to another. Independent districts of over 500 census children, levying a local tax and employing a superintendent of schools, are permitted to have a city board of examiners and issue city certificates, though the standards must not be lower than the standards required for the issuance of state certificates of similar grades. Graduates of certain approved colleges and normal schools and persons who have received credit for a certain number of courses may be certificated without examination. A graded maximum salary schedule exists for teachers in districts not levying local taxes, based on the school census, and with monthly maximum salaries of $40, $60, $75, and $85 for the four grades of teachers' certificates.

For the training of new teachers, the state maintains the Sam Houston Normal Institute at Huntsville; the North Texas State Normal College at Denton; the Southwest Texas State Normal School at San Marcos; and the West Texas State Normal College at Canyon, all for white teachers; and the Prairie View State Normal and Industrial School at Prairie View for colored students. For the training of new teachers and those in service as well, the state provides annually for a large number of five-weeks' summer normal institutes. There were seventy-three institutes for white teachers in 1910, and forty-three for colored teachers. These summer institutes play an important part in providing some training for the teachers of the rural and town schools of the state.

Educational Conditions. — The great size of the state and the sparse population in many parts of it make the maintenance of good schools generally more difficult than would otherwise be the case. The state is essentially rural and agricultural, as over four fifths of the total population live in country districts, while but one eighth live in cities of over 8000 population. About one fifth of the total population is negro, and over 90 per cent are native born. A six-months' term is required. Much progress has been made during the past five or six years, though much still remains to be done to develop an efficient school system. The larger number of the independent districts (615 in 1910) at present provide the best schools, but their independent organization is likely in time to prove an element of weakness in the development of a strong system of education. Some form of general county taxation, a better plan for the apportionment of school funds (*q.v.*), and the introduction of a county system of school administration (*q.v.*) would almost from the first create new educational conditions in the state.

Secondary Education. — The independent districts of the state usually maintain good high schools, in good modern school buildings, with ample equipment, but until very recently, no satisfactory provision for secondary education for rural pupils had been evolved. The new (1911) state law providing for the establishment and maintenance of high schools in rural districts will doubtless prove of much value in extending the advantages of secondary education. Four hundred and twenty public high schools were reported for the state in 1910, thirty-six of which were for the colored race.

Higher and Special Education. — The University of Texas (*q.v.*), at Austin, a large and important institution, stands at the head of the public school system of the state. The Agricultural and Mechanical College (*q.v.*), at Bryan, technically regarded as a branch of the State University, is the Agricultural and Mechanical College for the state. The Prairie View State Normal and Industrial School also provides agricultural and mechanical instruction for colored students and is under the control of the board of directors of the Agricultural and Mechanical College at Bryan. The State College of Industrial Arts (*q.v.*) at

Denton offers for girls work similar in purpose to that offered by the Agricultural and Mechanical College for boys. In addition to the state institutions, twenty-three denominational colleges, four of which are for women, and six for the colored race, also offer collegiate instruction within the state.

The state also maintains the State School for the Blind at Austin; the State School for the Deaf and Dumb also at Austin; the State School and Orphan Home at Corsicana; the State Institution for the Training of Juveniles at Gatesville; and the State School for Deaf, Dumb, and Blind Colored Youths at Austin. E. P. C.

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TEXAS, UNIVERSITY OF, AUSTIN, TEX. — The first constitution of the Republic, 1836, declared it to be the duty of congress "to provide, as soon as circumstances will permit, . . . a general system of education." The first direct steps toward the founding of the University were taken by the congress of the Republic in two acts passed during January, 1839. One of these provided for the setting apart of land for a campus in the future city of Austin. The other appropriated fifty leagues of the vacant lands of the Republic for the purpose of University education. The establishment of the University was provided for by an act of the legislature, Feb. 11, 1858, making provision for the endowment of the University by adding to the fifty leagues granted in 1839 one hundred thousand dollars in United States bonds, and one section of land out of every ten reserved for the use of the state by the various acts of the legislature. Provision was also made for the organization of the University, but was not carried out because of the Civil War and the unhappy era of reconstruction. Indeed, under the exigencies of war, a large portion of the University endowment had been turned into the general revenue account and appropriated to the necessities of the state. The constitution of 1876 took away from the endowment the lands which had been added to it by the act of 1858, and gave in lieu thereof one million acres farther west. To the lands previously set apart and appropriated for the endowment, the legislature, in 1883, added one million acres. This land and about $650,000 in bonds constitute the permanent endowment of the University. The present annual income from endowment is $160,000 annually. The legislature's appropriation, in addition, for the biennium 1911–1913 was for the first year $268,000; for the second year $400,000.

The act of the legislature providing for the organization of the University was passed in 1881. It provided for the location of the institution by popular vote, and for the appointment of a Board of Regents, to be entrusted with its organization and government. Among the provisions of the act affecting the policy of the University may be mentioned the limitation of the matriculation fee to $30, the admission of men and women on equal terms without charge for tuition, and the injunction that no religious qualification should be required for admission to any office or privilege connected with the University, and that no sectarian instruction should be given therein. By popular election in September, 1881, the main University was located at Austin, and the medical department at Galveston.

The government of the University is vested in a board of eight regents, selected from different portions of the state, nominated by the governor, and appointed by and with the advice and consent of the senate. The active management of the University is in the hands of a president and six deans. There are maintained the college of arts, and departments of law, engineering, education, and medicine. S. E. Mezers is now president.

The combined libraries contain about one hundred thousand volumes, and there are well equipped laboratories for the study of medicine, physics, chemistry, geology, botany, and zoölogy. The total value of the entire University plant, which consists of about fifty acres of land and eleven buildings, is estimated at $2,000,000. The entrance requirements for the college of arts and the departments of engineering and education, are fourteen units, two of which may be conditional to be absolved before the end of the freshman year. Students entering the departments of law and medicine must present in addition five college courses.

For the session of 1910–1911 there was a total registration of 2758 students; of these 819 were registrations of the summer school or the department of extension. The total number of instructors, officers, and student assistants was 191. J. A. L.

TEXTBOOK COMMISSIONS. — Bodies, created by law, for the purpose of adopting textbooks for use in the public schools. They may be state, county, or city commissions. State textbook commissions are the most common. Twenty-eight states have such bodies, though in five states the adoptions are by county textbook bodies. Two other states have a combination plan, by which counties adopt one book on each subject from a number of books previously designated by a state commission. In approximately half of the twenty-two states making state adoptions, the state board of education acts *ex officio* as a state textbook commission. In the remaining half, either a separate body, usually of schoolmen, is appointed by the state board of education or by the governor; or additional members, either *ex officio* or by appointment, are added to the state board of education for the purpose. Illustrations of these different plans may be cited. The state board of education acts *ex officio* as a state textbook commission, in Delaware, Virginia, North Carolina, South Carolina, Georgia, Louisiana, Indiana, New Mexico, Arizona, and California. In Oklahoma, the governor appoints six citizens, a majority of whom must be engaged in school work, who with him form a state textbook commission. In West Virginia and Kansas, the textbook commission consists of the state superintendent, together with eight citizens. In Kentucky, the state textbook commission consists of the state board of education, the governor, the state auditor, the state treasurer, and the clerk of the court of appeals. In Nevada, the state board of education, together with four school men appointed by the governor, acts as the adopting body. In Idaho, the commission consists of the state superintendent and six citizens, two of whom must be business men and four educators, who are appointed by the state board of education. In Utah, the commission consists of the presidents of the State University, Agricultural College, and normal school, the state superintendent, and five appointed by the governor, three of whom must be county superintendents. In Iowa, Missouri, Wisconsin, South Dakota, and Washington, adoptions are made by county boards. In such cities as New York, Philadelphia, and Boston, the board of superindents acts *ex officio* as a city textbook commission, while in most other cities the city board of education acts on the recommendation of the city superintendent of schools.

E. P. C.

See TEXTBOOKS, for the duties of such bodies.

TEXTBOOKS. — Perhaps in no country of the world do textbooks play so important a part in instruction as is the case in the United States. A single simple outline text in the hands of the pupil, almost devoid of illustration, to be taught and explained by an especially skillful teacher, is the common European custom, while in America we have both textbooks and supplemental textbooks, elaborately illustrated and in abundance, for the pupils to use. The many small schools, the lack of trained teachers, and the lack of skilled supervision, have alike tended with us to an emphasis on the textbook, and publishers and authors have been in competition for decades in attempts to produce the most teachable texts. Both teachers and pupils have come to lean upon such textbooks, the recitation period has come to mean largely an examination upon the contents of the book, and tasks are assigned to be done by use of the books. Pupils make progress with the American type of textbook, even under poor teachers, whereas, with the German type of textbook, progress under such conditions would be almost impossible. In our rural schools, with their young and usually untrained teachers, lacking in information, method, and insight, a well-arranged and illustrated textbook is of the greatest assistance.

The tendency to rely too much upon the textbook has often been pointed out as one of the marked defects of American instruction, and in many of our city schools the rules of the board of education, or the directions of the superintendent of schools, have sought to remedy this defect by forbidding teachers, in certain of the elementary school subjects, to use a textbook while conducting a class. It has been sought, too, to train pupils in independence by having a number of supplemental textbooks for use, and also by the use of many supplemental books of an informational type. (See SUPPLEMENTAL BOOKS.)

Within recent years, the production of school textbooks has become a business of large proportions, and the character of the books produced is equaled nowhere in the world. New publishers with new plans and ideas have begun the publication of school textbooks, and new types of authors have entered the field. At no time in the history of textbook making in the United States have so many writers of the highest scholarship and pedagogical ability been engaged in the production of textbooks for use in the schools, and certainly at no time in our history have so many noteworthy textbooks appeared in such rapid succession on the market. In reading, history, geography, literature, and science many excellent supplemental books have also been produced and used, and new and better ones are each year being evolved. So many new books appear each year, and so many improvements are made, that the American textbook must still be considered as in a stage of rapid evolution, and hence it is important that the way for changes, to meet new progress in textbook making, should be left rather easy, and that attempts at enforcing rigidity in requirements should be resisted.

In the earlier schools there was no attempt at uniformity in the textbooks used. Each pupil brought to school the books the family had at home, and the teacher taught from these. Later, the advantage of uniformity for each school became evident, and the selection of the textbook to be used in each subject was left to the parents, assembled in district meeting (*q.v.*) to decide. With the passing of the district meeting, the selection was transferred to the trustees or directors, and in some states the teacher was ordered to be consulted in making the selection. In large districts, such as towns and cities, the selection of textbooks was given to the board of education, which came to act in turn upon the advice of the superintendent of schools.

While the cost of textbooks is not particularly heavy, and constitutes but a very small proportion of the total cost of education, the fact that the cost has fallen on the parent instead of being paid from the general taxes, has made it seem of extraordinary importance. Like the old "fuel tax," once so common, the cost for textbooks has seemed a heavy burden to bear. Parents have objected, in particular, to the necessity of buying a new set of textbooks for their children when moving to another district. The uniformity within a school has been accepted by parents as desirable, and they have then either raised the question as to why uniformity between schools is not also desirable, or why they should have to pay for textbooks at all. In the older and more thickly settled portions of the country, where schools can be maintained more economically, and where wealth is greater, the textbook charge has been absorbed by the public, and free textbooks have been provided; but in the poorer and more thinly settled sections, where the charge for textbooks could not be absorbed so easily, state or county uniformity has been substituted in an effort to reduce the cost. In all of the Southern states except five, county uniformity is the rule; while in the others, and in most of the Western states, state uniformity is the rule. One state, California, has also undertaken in addition to uniformity, the very costly experiment of printing its own textbooks, and now proposes to provide them free.

For the selection of these uniform series of textbooks, the different states requiring them have also created county or state textbook commissions (*q.v.*), for the purpose not only of selecting the books but of making the proper contracts with the publishers. To guard against too high prices, many states have fixed the maximum prices which may be paid, and price regulation has come to be a natural accompaniment of state uniformity. A common clause inserted in these contracts is one providing that the prices to be paid by the state adopting shall not exceed the prices in any other state, then or thereafter, and that if lower prices are subsequently granted to any other state, the same must apply in the contracting state also. In Ohio another form of contract is found. Instead of adopting one series of books, the state merely approves a number of books on each subject, and fixes the price at which each book must be sold, and local school boards may designate agents to sell them, at not over 10 per cent profit. Within recent years, a movement looking to the purchase of the books by the district, which then loans them to the pupils free of charge, has made marked headway. In some states the provision of free textbooks has been made optional, by vote of the people, while in others it has been made obligatory. In still other states the provision of free textbooks for indigents has been made a requirement, and in these states the question of making them free for all pupils keeps coming up from time to time.

The earliest free textbooks were provided by the cities, Philadelphia in 1818 being perhaps the first. Jersey City began to provide free books in 1830, and Newark in 1838. Charleston, S.C., was added in 1856; Hoboken and Elizabeth, N.J., sometime before 1860; and Chester, Penn., in 1864. In 1873 Massachusetts permitted any city or town to furnish free textbooks, and in 1884 made free textbooks obligatory for the state. Maine followed in 1889, New Hampshire in 1890, Delaware and Nebraska in 1891, Pennsylvania in 1893, New Jersey and Vermont in 1894, Wyoming in 1899, and Maryland in 1904. In but two states furnishing free textbooks, Delaware and California, does state uniformity prevail. Instead, the local administrative units select the books they desire, provide the schools with a sufficient supply, and loan them to the pupils, as is the common practice with supplemental readers, histories, and other supplemental books. The cost for textbooks is thus put upon the district instead of upon the parent, as has become the case with janitor service, fuel, and other school supplies. This results in great economy in purchase, and places the burden evenly on the community instead of placing it on the parents; poor parents and poor children do not have to carry what is often a heavy burden; the public schools are further popularized, and attendance increased; the work of the school starts the first day, without the the usual delay; uniformity within schools is secured, but not an unnecessary and hampering uniformity; and changes to better books are made much more easily. The extra work entailed on teachers and school authorities is more than compensated for by the saving in time effected in beginning work. It is often objected that the supplying of books free of charge weakens individual initiative and responsibility, but this same argument was once advanced against free schools themselves. The chief objections of value are the natural repugnance of cleanly children to handling books soiled by other children, the danger of disease, and the lack of ownership of books for a home library. In some states these objections are overcome by permission to pupils to purchase individual copies, while in other states this is not permitted, but books are disinfected and emphasis is put upon securing proper care of public property. The arguments against providing free textbooks are of much less weight than the arguments for the plan. The chief advantages are greatly decreased per capita cost, greater educational efficiency, and increased attendance at the public schools. The provision of free textbooks is only a slightly further extension of the plan of providing free tuition, free firewood, and free school supplies.

As long as textbooks must be purchased by the parents, state uniformity is desirable from the public point of view, but once free textbooks are provided, the chief reason for general uniformity passes, and the many educational advantages of liberty in selection now make general uniformity undesirable. The general uniformity plan is more costly than local adoptions, because no series of books ever adopted is equally well adapted to the needs of all schools, and the state books have to be supplemented by the purchase of many other books. Different needs are presented by the different parts of a state, and by different counties and cities within the same state, and the ability of cities and communities to make progress is often hampered by the use of books badly suited to their educational needs. A live school system is a growing school system, and a good course of study is a course of study in evolution. No set of men, however wise, can select a uniform series of textbooks suited to the needs of all communities within the state, even in the fundamental school subjects alone, because no such single series exists, and a state should not regard it as one of its functions to prescribe too narrowly or too rigidly the tools with which work is to be done.

One strong argument for uniformity lies in the reduction in cost, but this may be obtained without uniformity. The state can approve books for adoption and fix both sale and exchange prices, as is done in Ohio, leaving communities free to select such books as they desire from the approved list, and at the prices fixed by the state. This leaves the way open for the different administrative units to adopt the books best suited to their needs, and for a gradual change as books are worn out and as new books appear. Cities, under city superintendents of schools, certainly ought to be free to select the books they desire to use and furnish, while outside of cities, the unit of adoption should be the unit of supervision. In states using the county system of school administration (*q.v.*), and also in other states where the county superintendent or a county board of education looks after the interests of the schools of the county as a whole, the county is the natural unit for textbook uniformity. New books, also, ought not to be adopted for too long periods. Four years is about the life of a school book under the free textbook system, and this is a long enough period for adoption. As new and better books appear, and as a school system evolves in efficiency and educational insight, old books should be displaced by new and better ones, the old books, if still usable, being continued as supplemental books. In some subjects there are distinct advantages in having two or three different texts in a classroom, and too great a degree of uniformity ought not to be insisted upon.

The textbook question, in most of our American states, is as yet an unsettled one, and much unwise legislation on the subject has been put on our statute books. The "book trust" has been made a campaign "bogy," and the textbook question has been exaggerated out of all proper proportions. What ought not to constitute over three to four per cent of the annual cost of education has been made to seem of fundamental importance. Of the legislation on the subject which has been placed on our statute books, quite an amount of it has been unwise, and some of it has been both foolish and harmful.

E. P. C.

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TEXTBOOKS, FREE. — See Textbooks.

TEXTBOOKS, UNIFORM. — See Textbooks.

TEXTILE SCHOOLS. — See Industrial Education.

TEXTILES IN THE SCHOOLS. — See Household Arts.

TEXTUAL CRITICISM. — Textual criticism is the judging of a text for the purpose of determining its right form. This does not mean that we try to make the text say what we like, what we think to be the right thing to be said. The business of the textual critic is to settle all doubts as to what the given writer wrote. He is to say to us what the text was that the writer had before him when the book was done; that is, the original text. We wish to know what Plato or Cicero or Dante or Shakespeare or Goethe or Tennyson said.

A simple-minded man would be satisfied with the text that he found before him and would suppose it to be precisely what the author penned. Unfortunately, texts are often imperfect and corrupt. It may be that a reader finds passages which he cannot understand or words that seem to be meaningless, at best meaning nothing in the given context. Perhaps a keen mind has a suspicion that a certain sentence was changed to suit the views of later times. Or it is possible that some manuscript has been found with a different text, or that friends of the author have texts that do not agree with the current text or remember distinctly that originally given words had been written. In the case of comparatively late books it is even possible that proof sheets may be produced showing changes made by the author.

The work of a critic upon the text of a late book is commonly comparatively simple, although difficult problems may arise even there. The journey from the author to the printed text is for such writing a short one, and there is seldom room for great variations. The simplest case is that in which the original manuscript was sent to the compositor and in which the author himself did not read the proofs. If that original manuscript be preserved, the critic assumes anew the duties of the proof reader in the printing office and shows how the first proof reader either failed to understand the words as written or failed to make the printed words agree with those written. From this simple state of affairs books pass on to all manner of complications. If the author has himself read the proofs, and if, as is common, the sheets he has corrected have been thrown away, the question as to the text is not so easy as before. Every newly set-up edition during the life of the author adds new puzzles. Perhaps the compositor made the change, perhaps the author. Thus the Shakespeare and Goethe and Browning societies find a wide field for study. In rare cases a deeply rooted difficulty is presented by the fact that the author has written two manuscript copies with variations in the text.

If, however, we leave these modern texts and pass to those of ancient times, things take a totally different shape. The classics, both Greek and Latin, the Bible in the original languages, the writings of scholars through the years until the fifteenth century, were exposed to dangers much more pressing. The original manuscripts were copied again by scribes, and then recopied and recopied. There was nothing to take the place of the printed text as a means of putting the words of the authors under lock and key. Every scribe was liable to make serious mistakes, and every scribe had it in his power to change words or sentences at his own sweet will. Here, then, the chief work of textual criticism begins and we must follow it to see what it does.

The materials that the critic has at his command consist of manuscripts, books in writing, that bear in various ways upon the form of the text that he has to settle. The chief witnesses are the manuscripts of the text itself in the original language. The value of the given manuscript is the greater, other things being equal, the nearer it stands to the time and place of the original text. If there are a number of manuscripts, the critic must try by a comparison of the readings to show how they are related to each other, to divide them into groups according to these relations, and thus to fix their value for the decision of readings. If there are translations of the text into other languages, the manuscripts of these translations must be made to give their mite to the work. And the writings of authors, who may have quoted the words of the text here and there, must be searched through so as to add their testimony as to the form of the text at their day and where they lived.

The easiest thing to settle is the question as to large or long additions to or omissions from the text. Here the translations come into play and often go far to show whether the verses mooted are or are not part of the original text. A very common variation in texts is the change of the order of the words. In many cases the difference is immaterial even as a matter of emphasis. Sometimes the varying order is the result of the interpolation of one of the words. It will nevertheless not in the least be right to follow the scholar who a few years ago, setting out from the text of Cæsar, declared that in every such case of uncertain order one of the words must be spurious.

One of the most important principles is that the easier text is less likely to be original than the hard text. For it stands to reason that men who dealt with the text will in no case have been inclined to replace a thing that could be easily understood by a thing that was hard to understand. On the contrary, any one who lighted upon a hard place would be inclined to make it easy by some change of text. The easier reading is the false reading.

Another great principle is that the reading which explains the existence of the other reading or readings must be the original one. A reading which is open to misconception, which may give rise to a misunderstanding that another reading makes impossible, cannot be the result of this latter reading, but must offer the source of the latter reading. This may sometimes even apply to external things. A certain semblance in the letters of a word may have caused a scribe to write a different word or words, that could not by a reversed mistake have occasioned the insertion of the word first mentioned.

So far as the witnesses to the old text are concerned, they must be weighed, not counted. A translation that follows the original text slavishly is worth more than one that paraphrases glibly the general sense. An author who is writing an essay is less likely to quote exactly than one who is treating of the text as a commentator. And a general consent of witnesses from districts that are widely separated from each other geographically is more likely to be the result of an original reading than one which appears in but one place.

It sometimes happens that no reading at hand gives a reasonable sense for a passage. In such a case we do not say that Homer fell asleep, but that the original reading has in some way been lost — once in Arrian a horse appears to have abolished a reading with his hoof. In such places conjecture is the only resort. Bentley and Lachmann were skillful in reaching by divination the original words. More than once such conjectures have been proved right by witnesses that were discovered later.

History of Critical Criticism. — The fact that texts were easily corrupted was well known to the ancients. Cicero took great pains to secure at least a favorable beginning for the transmission of his precious words. After the beginning of the Christian era new difficulties arose in connection with ancient texts, in so far as Christians were sometimes inclined to alter, or to interpolate, both Jewish and classical writings so as to make them agree better with their views. The same tendency to change texts came into play among the Christians themselves. Indeed not only the writings of learned or official Christians but even the sacred writings of the New Testament fell a prey to pens that through carelessness or through wilfulness put other words in the place of the original words.

It is a matter of course that authors, so far as they came to learn of the perversion of their works, and pupils who discovered the way in which the writings of their masters had been trifled with, did all they could to block off the corruption and to restore as well as to secure the pure tradition of the texts in question. The first great piece of work in textual criticism of which we know anything was possibly the collation of the various writings brought together eighty-three years before Christ, when the Romans set about replacing the Sibylline books that had been burned. I say possibly, because, at this distance of time and with our scant knowledge of what was done, it is difficult to say whether the process was applied more to the authenticity of certain books or to the condition of the text examined word for word. It is, however, difficult to see how in this case a painfully exact criticism of the text could be avoided. Another large enterprise in textual criticism fell at the latter part of the fourth century, when Jerome at the desire of Damasus, the bishop of Rome, endeavored to purify and settle the text of the Latin Bible.

From that time on, the sacred text held for a long time a preëminent place in textual discussion. The interest in classical authors declined and theology held all in its sway. During the Middle Ages repeated efforts were made, now at Charlemagne's command, now upon the suggestion of some bishop, now as the result of the work of a monastic order, to purge the text of the Latin Bible. I may here anticipate and say that this work has only of late years begun to take a more definite and final shape, on the one hand for the New Testament in the edition of the late John Wordsworth, carried on with Henry Julian White, and now to be finished by him; and on the other hand in the first instance for the Old Testament in the vast work later undertaken by the Benedictines under the guidance of Aidan Gasquet.

After the so-called Revival of Learning, which might be called the Renewal of the Study of the Classics, the scholars of Western Europe were for the first moment so glad to have again the ancient texts and especially to learn Greek and have the Greek authors in their hands that questions of textual criticism were not taken all too seriously. The learned Greeks, whom the Turkish hordes scattered over the West, spent their time, aside from personal lessons, in copying the Greek texts at hand for the use of new pupils. Little by little learning grew and England became, in the marvelously divinatory work of Bentley, the leader of textual criticism for the world. Shortly before Bentley, John Fell, and John Mill had treated the text of the New Testament in a masterly way, and Bengel in Würtemberg, also discussing the New Testament, found a worthy successor in the Swiss and then Dutch scholar Johann Jakob Wettstein who had done apprentice work for Bentley. The close of the sixteenth century saw the keenness of textual work both in classical and sacred writings pass largely to the continent, while the scholars of the English universities published annotated editions of texts drawn from foreign editions. Griesbach and Lachmann led. Lachmann became a representative of a new race of critics, of those who occupied themselves with texts not merely of sacred or of Greek and Latin classical writers but also of comparatively recent authors.

During the nineteenth century this criticism of newer texts has, in combination with the explanation of these texts, caused the rise of numerous societies in various lands addicted to the works now of Dante, now of Shakespeare, now of Goethe or of Schiller or Browning.

During the last quarter of a century two quite different things have had an important effect upon the work on ancient texts. One of these was the new impulse given to Greek philology by the discovery of the remains of ancient writings upon papyrus or even parchment in the mummy cases and in the dry sand heaps of Egypt. The new witnesses gave us, are still giving us, it is true, many a new, hitherto unknown piece of literature, and that has spurred scholars on to the task of reconstituting or of determining the original form of these often much damaged remains. They have, however, also had the valuable effect of showing the correctness of some earlier conjectural emendations, and they have thrown much light upon the character of the language in current use in the last centuries before and the first centuries after the beginning of our era, thus enabling critics to judge better of the possibilities in the case of doubtful readings.

The other thing that has much increased the interest in textual criticism, is the advance made in photography and in photographic printing. The exactness, the precision of finish, and the cheapness of the newer processes places reproductions of whole manuscripts or of specially desired parts of them at the command of scholars throughout the world. A professor in a western college can thus collate a text preserved at Oxford, at Paris, or at Rome, without leaving home.

Happily America is also awaking and beginning to see the value of the ancient manuscripts themselves. The New Testament manuscripts in Drew Theological Seminary at Madison, New Jersey, the remarkable Biblical manuscripts of Mr. Freer in Detroit, and the epoch-making Coptic manuscripts of Mr. Morgan in New York show this. C. R. G.

THAYER, GIDEON FRENCH (1793–1863). — Educator and founder of Chauncy Hall School; was educated in the public schools of Boston. He founded the Chauncy Hall School and was its principal until 1855. He was editor of the *Massachusetts Teacher*, and one of the founders of the American Institute of Instruction (*q.v.*) and the Massachusetts Teachers' Association. His publications include *Letters to a Young Teacher*, fifty thousand copies of which were distributed by Henry Barnard (*q.v.*) among the teachers of Connecticut. W. S. M.

THAYER, SYLVANUS (1785–1872). — President of the United States Military Academy; was graduated from Dartmouth College in 1807 and the United States Military Academy at West Point in 1808. He was sent by the United States government to Europe to study systems of military education in 1815; and upon his return, two years later, he was chosen president of the United States Military Academy. "He organized the school on its present basis and raised it from an elementary condition to the rank of the best military schools in Europe." He was president of the academy until 1833. W. S. M.

See Military Education; United States Military Academy.

THEATER AND THE SCHOOL. — See Drama and Education; Festivals, School.

THEISM. — The intellectual formulation of the belief in a single, conscious, spiritual, ultimate reality, God, the creator and redeemer of the world. It is opposed generically to atheism and polytheism and specifically to pantheism and deism. To the former, by its insistence upon the distinctive and independent personality of God; to the latter, by its greater emphasis upon the active presence of God in the world and especially in human affairs. Historically, theism has been associated with Christianity and deism with "natural religion," involving a denial of revelation, and of the intervention of the supernatural in the natural. Deism has denied miracles while theism has admitted their possibility. In some of its later forms, theism tends to approach, however, the earlier deism. J. D.

THEMES. — See Composition.

THEODORE OF TARSUS (*c.* 602–690). — Seventh Archbishop of Canterbury; holds an important place in the history of the Christian church in England, as organizer, and in the history of schools and learning as the principal founder of the schools of England at a time when England began to take for a brief period the lead in the schools of the West. Theodore was born at Tarsus in Cilicia about 602, and was educated partly at Athens. The details of his life prior to 667, when he appears at Rome, are very obscure. In the next year, on the recommendation of Adrian, the abbot of the monastery where Theodore, already a Basilian monk, was living, he was appointed and consecrated Archbishop of Canterbury by Pope Vitalian. He went at once to England, accompanied by Adrian, who had himself declined the archbishopric. In England Theodore carried out the first archiepiscopal visitation and became the first archbishop who presided over the entire English Church. At the council of Hertford in 673 he organized that church as coextensive with the English race and thus effected the ecclesiastical unity of England more than two hundred years before the political unity was complete. Theodore was a remarkable instance of a man whose title to fame is entirely due to work done after his seventieth year. But apart from his work as an organizer, Theodore takes high rank among men who have influenced the spiritual development of the West. His *Penitential*, composed of directions for administering penance in the moral training which the church gave the rude invaders of the West, became so famous that it was required, in some parts of the church on the continent, that every priest provide himself with a copy. Much of it passed into the canon law as codified by Gratian in the twelfth century. In the schools established by him in Canterbury and indirectly elsewhere Theodore became the principal founder of Anglo-Saxon learning and culture. At Canterbury he had the assistance of Adrian but also taught himself. All the customary branches were pursued in the school, and special attention was given to Greek and Latin. From Canterbury pupils went to all parts of England but especially to York and other parts of the kingdom of Northumbria. Some, becoming bishops and abbots, established new schools in connection with their cathedrals and monasteries. It is to this group of schools, begun by Theodore and distinguished by Bede, that the schools established by Charles the

Great on the Continent are to be traced. Alcuin was from York, whence his scholastic pedigree runs back to Canterbury and Theodore of Tarsus. J. C. A., Jr.

See Adrian; Bishops' Schools.

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THEOLOGICAL EDUCATION. — Historical. — *The Early Church.* — The need of a separate training for the ministry was not at first felt in the church. Indeed, the differentiation between clergy and laity was itself of slow growth. Under such conditions a very simple training sufficed. An acquaintance with the Old Testament, the common textbook of the religion of the day, a knowledge of the words of Jesus and of the most important facts of his life, an acquaintance with the baptismal formula, the earliest Christian creed, and with the forms to be followed in the daily worship and in the administration of the Lord's Supper, — these, together with a few practical rules of conduct, constituted the stock in trade of the early Christian preacher. (See Catechumenal Schools; Christian Education in the Early Church.)

Two influences rendered this early state of things unsatisfactory and led to the development of more elaborate systems of education. The first was the contact of Christianity with the culture of the ancient world; the second, the growth of the church as an institution.

In I Corinthians (i, 26–28) Paul speaks of the absence of learned men among his converts. But before the end of the first century this condition of things had changed. The Greek converts soon outnumbered the Jews and included in their numbers men of philosophic insight and scholarly training. The apologetic literature of the second century was addressed to men who were familiar with the learning of the time, and it was clear that if the Christian ministry was to appeal successfully to men of this class, some more elaborate training was necessary. The first Christian schools sprang up in answer to this need. Some of them were conducted by private individuals; others, of a more formal character, were established and maintained by the authorities of the church. To the first class belonged the schools of Justin, Irenæus, and Tatian, as well as that of the Monarchians, Theodotus, the leather worker, and his successor Theodotus, the money changer, at Rome. To the second class belonged the great school at Alexandria, which flourished in the third and fourth centuries, and the schools at Jerusalem, Cæsarea, Antioch, Edessa, and Nisibis. The training given in these church, or catechetical, schools was of the most elaborate character. The curriculum embraced all the subjects of human knowledge known at the time, and the lectures were open not only to Christians, but to non-Christians as well. Thus, Origen (*q.v.*), head of the school at Alexandria, lectured not only upon exegesis and upon apologetics, but upon secular philosophy as well. He was master of all the arts and graces of rhetoric, and his lectures were eagerly attended by men who had no thought of Christian service. (See Catechetical Schools.) The effect of these schools upon the training of the ministry was twofold. In the first place, it furnished a set of men who were competent to meet the leading thinkers of the day on their own ground. In the second place, it led to the formation of a distinct Christian literature which in turn furnished material for the Christian education of the future. Origen was the first great systematic theologian of the church. Lucian at Antioch laid the foundations of a scientific exegesis. Among their pupils and disciples were some of the most influential writers of the patristic period.

The second influence which affected the training of the ministry was the growth of the church as an institution, and especially the rapid development of the power and authority of the bishops. We have seen that the catechetical schools were founded and supported by the church, but it was soon found that the experiment was not without its dangers. The concessions made by Origen proved offensive to men of rigorous orthodoxy. Antioch became a center of the rising Arianism and was discredited thereby. More and more the bishops, conscious of their responsibility for the welfare of the church, felt the need of extending their control to the beliefs of her ministers. The conception of the church as an authoritative institution, preserving unchanged from age to age the deposit of truth which it had received from the beginning, began increasingly to dominate the ideals of Christian education. Free speculation was discouraged, and the mark of the successful minister came to be an unquestioning acceptance of the creed and a faithful performance of the liturgy.

Nor was the limitation upon freedom only inward. In matters of conduct also the separatist ideal made itself felt. With the growth of monasticism, ascetic practices came to be looked upon as a mark of the higher Christian life, and this change also had its effect upon educational method. For leadership in the church, not merely conformity in thought was requisite but separateness of life. So we see men like Jerome (*q.v.*), who represents the highest development of the learning of his day, turning their steps to the desert to carry on their studies without interruption in the leisure of hermitage or monastery.

Apart from its contribution to the growth of ascetic and separatist ideals, monasticism affected Christian education in two ways: (1) by the creation of a leisure class who had time to give to study, and (2) by the fact that its members enjoyed greater freedom from ecclesiastical control than the regular priests, and therefore furnished a field where new opinions might more easily take root. For both these reasons it was destined to prove a factor of far-reaching importance in the development of theological education.

The Middle Ages. — During the Middle Ages there persisted the two ideals to which reference has already been made, that of a broad and comprehensive training taking in all the knowledge of the time, and that of a narrow training largely disciplinary in character and designed primarily to fit the prospective priest for his vocation. The only difference was that in this period the restraint of an independent culture was removed, and the church became the guardian of all the learning of the day. Candidates for the priesthood received their training in schools maintained by the bishops at the cathedral towns, or where this proved inconvenient, in the home by some local priest in the country.

A revived interest in ministerial training showed itself under Charlemagne (*q.v.*). The bishops' schools (*q.v.*) were revived and new ones founded. Provision was made for lay as well as clerical instruction, and the school at the palace came to be the seat of the training of the higher clergy. The same movement continued under Louis, under whom schools for higher education were founded at Tours, Lyons, and Fulda. Most important of all the bishops' schools was that at Rome, which was carried on in connection with the church of St. John Lateran. Here too in the ninth century we find a seminary for English youths, which was revived by Alfred the Great, in 889.

Side by side with the bishops' schools and equally important, were the great monastic schools. The Benedictines (*q.v.*) especially were pioneers in the work of education. One of the accompaniments of the great revival at Cluny in the tenth century was a renewed interest in education. Under its influence the monastic schools became formidable rivals of the bishops' schools. But the movement was only temporary, and with the growth of the universities two centuries later they lost their preëminence.

Nor was the monastic ideal confined to the monastic schools. As early as the sixth century we find the Council of Toledo (531) ordaining that boys destined for the church should be brought up in a house attached to the cathedral under the oversight of the bishop. In England, Augustine (*q.r.*), following the example of his great predecessor of the same name, introduced a cœnobite life, and ordained it for his younger clergy, and the same practice was followed by other bishops. It was recognized that it was necessary not simply to train the mind, but also to school the will and form those habits of obedience and discipline which were fundamental in the priestly ideal of the Middle Ages.

With the founding of the great universities (*q.v.*) from the eleventh century on, begins a new chapter in the history of theological education. Some made a specialty of law, others of medicine, still others — and these the most important, like Paris and Oxford — of theology.[1]

The influence of the university was a double one. It not only preserved the knowledge that was in existence, but it was a center of research, creating new materials for education. Most of the great theologians of the twelfth and thirteenth centuries were university teachers, and without the presence of these centers, the movement that we call scholasticism (*q.r.*) would have been impossible. Here for the first time the attempt was made to gather together in comprehensive systems all the knowledge of the time. Here was completed that union of the secular and the religious, of Greek philosophy and Christian dogma, which was characteristic of the highest life of the Middle Ages.

With the rise of the mendicant orders a powerful impetus was given to the cause of theological education. From the first, the Dominicans (*q.v.*) recognized the strategic importance of the universities for their propaganda and soon established their colleges at every important university. The Franciscans (*q.v.*) were not far behind. Soon the representative scholars of the two great orders became candidates for the university chairs, and from the middle of the twelfth century on their rivalry became the chief factor in the history of medieval education. The Dominicans could boast Albertus Magnus and Aquinas (*qq.r.*), the Franciscans Alexander of Hales, Bonaventura, and Duns Scotus (*qq.v.*). It is to their influence that is due the reconciliation of the rediscovered Aristotle with the dogma of the church, and the popes, at first suspicious, came to rely upon them as the chief defenders of orthodoxy. Apart from the universities the mendicants exercised a powerful influence on theological education through their own convent schools.

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[1] At first it was the policy of the popes to concentrate theological instruction at certain centers, notably at Paris which for a long time retained the monopoly of granting theological degrees, but in due course this privilege was extended to other universities, *e.g.* Rome, Perugia, Padua, Salamanca, Montpellier, Toulouse, Vienna, Prague, etc. None of these later foundations, however, could compete in importance with Paris, which throughout the Middle Ages remained the great center of theological study. Not a few of the Italian universities, notably Bologna, never developed theological faculties, their service to ministerial education consisting in the training which they gave in canon law, which during the Middle Ages was an indispensable element in the education of a successful ecclesiastic.

Instruction in the universities was ordinarily given by lectures. There were two courses, ordinary and extraordinary, the former being given by the regular professors, and the latter by their assistants. As time went on the assistants took over more and more of the regular work, the professors lecturing only at intervals sufficient to justify their tenure of office. The subjects taught were exegesis, systematic theology, morals, and homiletics. Theology was commonly taught in the form of a commentary upon the *Sentences* of Peter Lombard (*q.v.*), which, with the Bible, held its place throughout the entire Middle Ages as the chief theological textbook. Disputes were held from time to time under the direction of the assistants. At first the course lasted eight years and led through the intermediate degree of Bachelor to that of Doctor of Theology. In 1366 it was extended to sixteen years, though the requirement was not always taken very strictly. The time was reduced one year in 1452. In the convent schools the course commonly lasted for three years.

The problem of regulating the daily life of the great numbers of theological students who gathered at the university was one which caused grave anxiety to the church authorities. Special dwellings were provided for their accommodation, and the attempt was made to regulate their lives and preserve them from the grosser forms of temptation in which the universities abounded. (See HALL or HOSTEL.) But if we can trust the records, the attempts were only measurably successful, and repeated complaints were made that the contact with the students from other departments corrupted the morals and wasted the time of the theological students.

Still more serious, from the point of view of the church, was the danger to purity of doctrine. Clever teachers, following the example of Abélard (*q.v.*), propounded heretical views or, under the guise of reverence for the past, turned into ridicule the principle of authority. Strife in the orders for control bred faction and dispute and, in the later Middle Ages especially, a spirit of criticism and unrest awoke which was ominous for the future. Wyclif found in the University of Oxford a fertile field for the propagation of his new ideas. Paris was active in the great reform agitation which led to the calling of the Councils of Basel and Constance. It was at the University of Prague that John Huss was started on his heretical career, and through the habit of inquiry which the universities fostered the way was prepared in men's minds for the more formidable revolt which was to come. In view of these facts it is not strange that we should find a growing alienation between the universities and the church. Both Oxford and Paris were repeatedly the objects of papal censure, and in both cases the attempt of the central power to maintain an effective control proved a failure. The lesson thus learned was not soon forgotten, and when the restored Catholic church girded itself anew for its conflict with the rising Protestantism, it felt the need of a different and more effective instrument than the university.

It is not easy at this interval to estimate the influence of the universities upon the character of theological education as a whole. Undoubtedly the presence of these great centers of intellectual activity acted as a powerful stimulus to the more ambitious candidates for the priesthood. They broke down local and even national divisions, and helped to create that international consciousness which was one of the greatest assets of the medieval church. On the other hand, the weaker institutions suffered under their competition. In spite of repeated efforts to save them, the Bishops' schools declined and finally disappeared altogether. The monastic schools were more fortunate, but they suffered from the drafting of their ablest teachers and most ambitious students to the universities. Those who remained had to put up with second best. Under these circumstances the prestige of the local schools rapidly declined. When it is remembered that a small minority of the priesthood received a university education (not more than one per cent, according to the *Catholic Encyclopedia*, s.v. *Seminary*), it is clear that we must be on our guard against generalizing from the exceptional conditions prevailing at the universities as to the intellectual opportunities of the priesthood as a whole.

The Reformation and its Effects. — With the reformers a new period in theological education begins. This great movement had a double aspect, conservative and radical. It was radical in its attack upon existing ecclesiastical institutions. In its challenge of the principle of tradition, and its return to the New Testament as the supreme authority, it established a new standard which was revolutionary in its effect. Moreover, the reformation revived the early Christian ideal of religious training for laymen. The practice of catechizing, which had long fallen into disuse, once more came into favor, and the teaching function of the minister was emphasized.

On the other hand, the Reformation was conservative in its general conception of the church. It shared with Catholicism the dualistic view of the world, and with it conceived of the church as an ark of safety in a sea of corruption. Luther himself was suspicious of secular philosophy, regarding it as an ally of the old scholasticism which had obscured the simplicity of the Gospel. Melanchthon and Calvin were less radical in their opposition, but in their case, too, the use of philosophy was simply formal. It was an instrument of method, but not a source of independent knowledge. This was all the more significant because of the fact that they were university-trained men, and that the movement of which they were leaders was born in the university.

In the sphere of biblical interpretation the Reformers were hospitable to the new knowledge. Under the influence of the Renaissance the study of the classics was revived, and in 1516 Erasmus published his edition of the Greek Testament. In this new and better text the Reformers found a powerful weapon in their contest against Rome. For the Vulgate translation they substituted an appeal to the original text. The study of Hebrew as well as of Greek was revived, and ever since, Protestantism has been a fruitful source of linguistic and exegetical scholarship.

The effect of the Reformation on the old curriculum was radical. Scholastic theology, in the old sense, was banished, and exegesis made the center of the theological curriculum. A great part of the work of the Reformers consists in commentaries on the chief books of the Bible, and in this form most of their instruction was imparted.

Next in importance was dogmatic theology. This was not at first conceived as an independent discipline, but rather as a brief compend, a summary of the chief points of Scripture teaching put in a convenient form for use. Melanchthon's *Loci* and Calvin's *Institutes* are examples of the early textbooks of Protestantism, and in each the Scripture references bulk largely. Much attention was also given to practical matters, the nature of the church and its institutions, and to a warning against the various superstitious practices of Catholicism.

As time went on and Protestantism developed its own educational tradition, dogmatics came to hold a larger and larger place in the curriculum. Later theologians were no longer content with the brevity of the fathers, but built up systems of their own, in which they discussed in detail the various points in which they differed from their opponents. A new scholasticism arose as pedantic and almost as voluminous as the old. Against this tendency Pietism (*q.v.*), emphasizing as it did the fundamental importance of a personal religious experience for the theologian, came as a needed reaction. In Germany Spener, and especially Francke (*qq.v.*), insisted upon better educational methods in the training of the ministry, and under their influence the theological curriculum was revised and stricter standards adopted. The movement on behalf of a scientific theological training was carried on by the rationalists, who were at one with the pietists in their insistence upon an educated ministry.

Almost from the first, the universities which were under Protestant influence became the training place of the rising ministry. This was true not simply in Germany (*e.g.* Wittenberg, Marburg, Leipzig, Tübingen, later Halle and Göttingen), but in Switzerland and in the countries of northern Europe as well (Basel in Switzerland, Upsala in Sweden, Copenhagen in Denmark, Groningen and Utrecht in the Netherlands, Oxford and Cambridge in England, Glasgow and Edinburgh in Scotland). Geneva, under Calvin's influence, became an educational center to which multitudes flocked for undergraduate or postgraduate study. Both in Lutheranism and Calvinism the ideal remained theocratic. The state was to be responsible for the training of the ministry, but the state was to be subject to the reformed church.

As time went on the deficiency of the university as a practical training school became apparent, and to remedy its weakness seminaries were established in which the candidate could receive instruction in the practice of his profession. The first of these seminaries was founded in 1690 at Riddagshausen near Brunswick, and it was soon succeeded by others. The movement, begun under Pietist influence, was continued by the Rationalists, and has become a part of the state program approved by all parties. (Schaff-Herzog, Vol. XI, p. 332.)

Nor was the effect of the Reformation upon theological education confined to Protestantism. The older church also was powerfully influenced by the new movement. One of the subjects which engaged the attention of the Council of Trent, the great reforming council which gave the program of the new Catholicism, was the problem of the education of the priesthood. The Council recommended the establishment of seminaries under the control of the bishops, in which the students should be subjected to moral as well as intellectual discipline, and guarded against the dangers which life in the university offered. While this program was never thoroughly carried through, and many Catholic students still continued to attend the university, it has remained to this day an ideal to which later generations of Catholics have continually returned.

With the rise of the Jesuit order a new factor was introduced into the educational program of Catholicism. Wedded to the strictest ideals of discipline and the most uncompromising loyalty to the See of Rome, the order early perceived the importance of education as a key to power, and used every means to secure control of the leading chairs. Both in the universities and through their own schools they became a powerful factor in the educational life of Catholicism and have remained so to this day. (See JESUITS AND EDUCATION.)

Later History. — First of all is to be noted the influence of the principle of nationality. With the Reformation the outward unity of the church was shattered and its place was taken by a number of state churches, each seeking to realize within its own field the same supremacy which had been sought by the Roman See in Christendom as a whole. This situation affected the educational problem in two ways. In the first place it centralized the control of the leading educational institutions in the hands of the separate states; and in the second place it introduced variety into the curriculum, which differed in the different countries according to the extent to which the reforming movement had gone. In the early days of Protestantism these national differences were consistent with a strong sense of the unity of the church, and the recognition by each of the great state churches of its sister churches as parts of the one Reformed church of Christ. But as time went on this early sense of unity was lost sight of, and the differences between the Protestants were magnified above their agreements.

This division and rivalry was greatly increased by the rising denominationalism. At first the ideal in each of the Reformed churches was, as has been said, that of a single state church. The little groups of Christians who refused to conform to the standards of the majority were regarded as heretics and schismatics. With the passage of the Act of Toleration in 1689, however, the principle of denominationalism was recognized in England, and a state of things established which has continued to this day. Since the control of the universities remained in the hands of the Established Church, it was necessary for the various denominations to make independent provision for the education of their own ministry, and so we find two different systems of education existing side by side in England: the university under the control of the state church, and the seminary, which is the organ of the denomination.

A third influence which has powerfully affected theological education in recent years is the growth of modern science, that great movement which has been revolutionizing all our education. Both in its broader aspect as philosophy and in its narrower aspect as science it has made itself felt within the theological school in a variety of ways. In part it has forced a reconstruction in methods of education through the application of critical principles to various departments of the curriculum. In part it has affected the ideals of the profession as a whole. The older conception of authority has been challenged, and the idea of secular science as the servant and handmaid of theology, the inheritance of the reformers from the Middle Ages, has been called in question. The result has been to raise a variety of questions which have not yet received a uniform answer and which will engage us further in connection with the third section of this article.

A fourth influence to be noted is the social and economic changes which have gone on parallel with this scientific movement and in part as its result. New conditions have arisen which have profoundly affected manners and morals. It is not merely that ideas have changed, but that social customs and habits have been revolutionized. With the rise of the factory system and the growth of great cities a variety of problems have emerged, for which the older ethical system provides no solution, and these problems in turn have reacted powerfully upon methods of ministerial education.

In its attitude to the modern movement in both its forms, theoretical and practical, Catholicism has shown itself on the whole much more conservative than Protestantism. It has been content to use such of the results of modern science as it could make subservient to its purposes, but it has been unswerving in its claim that science as a whole is the servant of the church whose function it is to determine its sphere and limits. Protestantism, on the other hand, while sharing a similar conservatism, has been on the whole much more open-minded, and in many of its institutions has shown itself hospitable to the new methods and results. The readjustment which the Modernists have thus far sought in vain in Catholicism is being rapidly brought about in Protestantism.

Present Situation. — *The Education of the Catholic Priesthood.* — In the Catholic ideal the church as an institution is responsible for the training of its clergy, not merely in the sense that it prescribes certain subjects which they must study and exacts certain pledges which they must make before entering upon their office, but in the sense that it deliberately undertakes to define their attitude toward life as a whole, and for that purpose assumes control of their education from their earliest years. The means of this training is the seminary, or church school.

The modern Catholic seminary dates from the Council of Trent, which, at its fifth session (January, 1546), ordered that provision should be made in every cathedral for the teaching of grammar and Holy Scripture to clerics and poor scholars. At a later session (23d July, 1563) a decree was adopted formulating a general plan which has ever since remained the fundamental law for the education of priests. The provisions of this plan are as follows: "(1) Every diocese is bound to support, to rear in piety, and to train in ecclesiastical discipline, a certain number of youths in a college to be chosen by the bishop for that purpose. Poor dioceses may combine; large dioceses may have more than one seminary. (2) In these institutions are to be received boys of at least twelve years of age who can read and write passably and by their good disposition give hope that they will persevere in the service of the church; children of the poor are to be preferred. (3) Besides the elements of a liberal education (as then understood) the students are to be given professional knowledge to enable them to preach, to conduct divine worship, and to administer the sacraments. (4) Seminaries are to be supported by a tax on the income of bishoprics, chapters, abbeys, and other benefices. (5) In the government of the seminary the Bishop is to be assisted by two commissions of priests, one for spiritual, the other for temporal matters." (*Catholic Cyclopedia*, s.v. *Seminary*.)

The purpose of the above plan has been variously interpreted. Liberal Catholics (*e.g.* Kraus) maintain that it was designed to supplement the weakness of the existing university system by providing adequate means of preparatory training under church control, and that it is therefore entirely consistent with the recognition and use by the church of other educational facilities. Those whose educational ideal is more exclusive contend that it was designed as a substitute for the older system and that any use of independent institutions, not provided for in the plan, is of the nature of a temporary expedient. This difference of attitude is explicable in the light of the historical development. In distinctly Catholic countries like Italy, Spain, Austria, and France, where there was little opposition to the Roman church, the seminary system was easily adopted, and developed so rapidly as to become a dangerous competitor of the universities. In Protestant countries like Germany and England, on the other hand, it was difficult, if not impossible, to carry through the plan of Trent, and it was necessary therefore to find some substitute. Such a substitute was found either in the creation of national training schools on foreign soil (as in England and Ireland), or in a compromise with the state (as in Germany), as a result of which the state provided theological instruction at the university through a Catholic theological faculty approved by the church. There are in Germany to-day eight such Faculties, at the universities of Bonn, Breslau, Freiburg, Munich, Münster, Tübingen, Würzburg, and Strassburg.

A further complication has been introduced by the varying relations between church and state. As a result of the growing spirit of nationality, even Catholic countries like Italy and France which in the past have subsidized the church have secularized education, and as a result the educational resources of the church have been much impaired. In the United States where the separation of state and church is accepted by all parties as a cardinal political principle, the church has been from the first thrown upon its own resources and obliged to develop its educational institutions without outside assistance.

As at present administered the existing seminary system differs from the plan of Trent in its greater concentration and in its less exclusive character. As originally proposed, the latter contemplated a diocesan system in which each bishopric should have its own schools and train its own priests. Experience has shown that this method, even if practicable, would be wasteful, and the present tendency is to concentrate at least the higher branches of education in a few strong institutions serving many dioceses and in not a few cases the church as a whole, *e.g.* the French Institutes at Paris and Toulouse, the Irish College at Maynooth, the English Seminary at Westminster, Laval University in Quebec, the Catholic University at Washington, and the Gregorian University at Rome.[1]

A further difference appears in the treatment of the preparatory or college course (the so-called little seminary as distinct from the greater seminary, or theological school). Here again the plan originally proposed contemplated the isolation of the prospective theological student from his twelfth year on. But this also proved impracticable, and to-day many candidates for the priesthood receive their preparatory training in institutions which admit other students as well. This is true, not simply in Protestant countries like England, Germany, and America, where considerations of economy are controlling, but in Catholic countries like France as well.

The preparatory course ordinarily lasts six years. It includes Christian doctrine, Latin and Greek, English, at least one other modern language, rhetoric and elocution, history, and geography, mathematics and the natural sciences, the Gregorian chant, and bookkeeping. This is followed by the seminary course proper, which also extends over six years. The first two years are devoted to the study of philosophy, the Bible, church history, and the natural sciences in their relation to religion. The last four years include Holy Scripture, with Greek and Hebrew, apologetics, dogmatic, moral, and pastoral theology, church history, and in some institutions liturgy and canon law. The seminary course is designed for a double purpose: (1) to equip the ordinary student with the knowledge necessary for the discharge of his functions as a priest, and (2) to prepare brighter students for more advanced work at the university, or other institution for higher education. Instruction is given in Latin, the common ecclesiastical language, and consists partly of lecture, partly of recitation, with practical exercises in discussion and debate. Graduates of seminaries who desire to carry their studies further may visit one of the higher institutions already referred to in their own country, or, if they prefer, they may go to Rome and attend lectures at the Gregorian University or one of the other Roman institutions of university grade. Candidates for the foreign mission field receive their training at the college of the Propaganda at Rome, or at one of the other institutions for the training of missionaries. In addition to the intellectual training of the seminary, the student is subjected to a rigorous moral discipline. He rises at five or half past five and makes his meditation for a half hour, hears mass, and frequently receives the communion. Four hours during the morning are devoted to classroom work and private study, and a similar amount of time in the afternoon. Another hour of study follows in the evening, and the day closes with prayer. During the entire course he is under spiritual supervision and direction and devotes no less than three hours a day to distinctly religious exercises.

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[1] Cf. Kraus's criticism of the seminaries of Italy and Hungary, *op. cit.*, pp. 17–20.

In theory the control of the seminary rests with the bishop of the diocese, who is responsible for the appointment and removal of professors as well as for the internal administration of the seminary in all its details.[1] In practice, however, many bishops avail themselves of the service of religious orders, some of which, *e.g.*, the Eudists, Lazarists, Marists, Oratorians, and Sulpicians, have a general permission from the Holy See to accept seminaries intrusted to them, while in other cases a special permission from Rome is necessary before a transfer can take place. A general supervision is exercised over the entire system of seminary education by the Pope through the Congregation of Consistory which is charged, among other things, with the control of education.

The center of the Roman educational system is at Rome and consists in the so-called Roman Colleges, a group of institutions of different antiquity and strength, designed either to give a general theological training, or to fit men for special forms of service. Some of these, like the English and American colleges, are simply residence halls where groups of men live who are pursuing their higher studies elsewhere, and others are of a university character in that they give instruction to non-resident students. The most important of the latter are the College of the Propaganda, the Dominican College, and the Roman Seminary. The Gregorian University, the largest educational institution at Rome, attended by more than a thousand students, is purely a teaching body, drawing its students from the resident colleges.

A powerful agency of the curia in its effort to maintain an effective control of theological education has been the Jesuit order, which from the first has taken an active part in educational work and especially in the education of the priesthood. Not only have Jesuits established schools in connection with their own monasteries, but almost from their inception they were given the right to teach in the diocesan seminaries, and ever since have exercised a powerful influence on the training of the priesthood. Although limited to-day in many ways, especially in Italy, France, and Germany, where their part in the contest between church and state has led either to the suppression of the order or to such restrictions as seriously limit their freedom, they are still a potent factor in the existing educational situation. The Gregorian University at Rome is in their charge. (See JESUITS, EDUCATIONAL WORK OF.)

Apart from the Jesuits, a number of other orders have taken an active part in the work of education and scholarship. To the Benedictines (*q.v.*) of the seventeenth century we owe the great editions of the Fathers which remain to this day the foundation of all later scholarship. The services of the Oratorians (*q.v.*) and the Port Royalists (*q.v.*) are familiar to all students, while a host of less known but none the less significant names carry on the traditions of scholarship and contribute their share to the training of the future priesthood. (See TEACHING ORDERS OF THE CATHOLIC CHURCH.)

It is difficult to obtain statistics as to the total number of students in Catholic institutions at present. During the year 1911–1912 there were in attendance at the Gregorian University 1030 theological students representing many different nationalities, and the total enrollment of the other institutions at Rome was probably still larger. Many of these were doubtless included among the attendants at the lectures at the University. Germany registered 1889 candidates in 1910; Canada had in 1911, 1567 students, of whom 408 were studying in preparatory, 650 in mixed, institutions, and 413 in distinctly theological schools. The United States had more than twice as many, of whom 1548 were studying in distinctly theological schools. In France the numbers have greatly declined as a result of the separation laws. The *Catholic Encyclopedia*, Vol. XIII, p. 700, gives a table of all students in English-speaking Catholic institutions, but the statistics are incomplete. Moreover, they do not distinguish candidates for the priesthood from those students in mixed institutions who are looking forward to other professions.

Passing from externals to the content of theological education, it is not easy for an outsider to pass an intelligent judgment on the present situation. In spite of her conservatism, the Roman church has not been unaffected by the forces which have been modifying the educational methods of Protestantism. The same two tendencies which we have already distinguished in the earlier history live on in the church of to-day — the ideal of a broad and comprehensive training, hospitable to contemporary philosophy and science, and the narrower separatist ideal distrustful of reason and magnifying ecclesiastical authority. Recently, as a result of the movement known as Modernism, this controversy has become acute, and at every point we see the two parties arrayed one against the other. At first sight indeed it might seem as if the contest were over. The forces of conservatism have gained the victory all along the line. In recent utterances the Pope has put himself on record in favor of the strictest control of education. Leading Modernists have been excommunicated, or deprived of their positions as teachers, and textbooks, formerly admitted without question, have been placed upon the *Index*. Nevertheless, the modern spirit is still alive in the church, and its influence is apparent whenever one looks below the surface. If one compares the curriculum of the modern Catholic seminary with that of the Middle Ages, or even of the seventeenth century, one sees how profound is the change which has taken place. Not only have new subjects been introduced, but the center of interest has shifted. History and exegesis, those two characteristic instruments of modern thought, have won a place from which not even the most conservative writer would think of dislodging them. One need only read such books as Hogan's *Clerical Studies*, or Scannell's *A Priest's Studies*, to see how great is the change which has taken place.

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[1] So far as the internal administration is concerned, two systems prevail. In one case the management of the seminary is in the hands of the rector, who with the bishop has full responsibility for the government of the seminary. In the other case all the professors have a share in the administration, and all important matters are decided by a faculty vote. (Cf. *Cath. Enc.*, Vol. XIII, p. 701.)

Theological Education in the Greek Church. — While agreeing with the Roman church in its general conception of religion, the Greek church has proved in practice less mobile and responsive to the currents of contemporary thought. The intellectual standard of its priesthood is, on the whole, low, and save in the case of a few exceptional individuals, it has made little contribution to productive scholarship. The orthodox Greek church in Russia is a state institution, and its schools are subject to the most rigid state control. These are of three kinds: elementary schools, which suffice for the training of the lower orders of the clergy; the diocesan seminaries where the priests receive their training, and the academies or theological schools for those who desire to pursue higher studies. These are four in number and are situated at St. Petersburg, Moscow, Kief, and Kazàn. The teachers at these academies were formerly monks, but these have now been supplanted by secular priests and in some instances by laymen. At least three fourths of the students hold free scholarships defrayed by the state, by dioceses, or by convents. The academies are the great recruiting ground for seminary teachers, and the Academy of Kazàn is a sort of orthodox propaganda which supplies the missions of Asia and of Europe.

Outside of Russia, the Greek church is represented by theological faculties at three universities, namely, Athens, Bucharest, and Czernowitz. In addition, it possesses six seminaries in which the instruction is of university grade, *i.e.* in which a gymnasium course, or its equivalent, is requisite for entrance, namely, at Zara in Dalmatia, Karlowitz and Hermannstadt in Germany, and Jerusalem, Belgrade, and Constantinople. Besides these there are a number of smaller seminaries which combine theological with academic training. For further details the reader is referred to Beth, *Die orientalische Christenheit der Mittelmeerländer*, 1902, pp. 99-104; and Leroy Beaulieu, *The Empire of the Tsars*, Eng. tr., Vol. III, pp. 227 *sq.*

Education of the Protestant Ministry in Continental Europe. — With few exceptions the institutions for the training of the Protestant ministry in Europe are supported and controlled by the state. This is the case in Germany, Switzerland, Holland, Denmark, Sweden, and Norway, and was until recently the case in France. Instruction is commonly given by the theological faculty of the university, and the successful passing of the examination prescribed by it for candidates for the ministry is the indispensable prerequisite of appointment to office. The system is a natural outgrowth of the establishment of religion, which was the result of the Reformation in Germany, Switzerland, and the countries of northern Europe. In France state support was guaranteed to the Protestant faculties of theology by the Concordat of Napoleon, but has been recently withdrawn as a result of the separation of church and state in 1905.

A typical example of the continental system is Germany. In seventeen of her twenty-one universities there are Protestant faculties of theology, the other four having Catholic faculties. In four cases both communions are represented. The theological faculty ordinarily consists of five full professors filling the chairs of the Old Testament, the New Testament, Church History, Systematic Theology, and Practical Theology. In many cases, however, there is more than one professor in a department, and in Berlin and Bonn the number of full professors reaches ten. Besides these there are frequently assistant professors (*Ausserordentliche*) and *Privatdozenten*, or lecturers, serving without compensation other than the fees which they receive from the students. In 1911 there were in Germany 124 full professors of theology, four retired full professors, thirty-two assistant professors, thirty-seven *Privatdozenten*, and eight lecturers.

The control of theological instruction is in the hands of the full professors. The assistants have no seats in the faculty and are seldom called upon to serve on committees. All appointments are made by the state, and the teaching body enjoys great freedom. While the professors are members of the state church and theoretically her representatives in the training of the ministry, little control is exercised by the ecclesiastical authorities over the character of the teaching in the university. Attempts to control this teaching are resented as an attack upon academic freedom and have commonly been unsuccessful.

As in other departments of the university, instruction is ordinarily given by lectures, for which a certificate of attendance is required. Courses may be taken in any order, and there is no restriction as to their number. The offering covers the usual subjects of theological instruction: the interpretation of the Bible, Old and New Testaments, the history of the church, its doctrines and institutions, systematic theology, with its correlative branches of apologetics and Christian ethics, and practical theology. The number of courses offered differs widely in different universities. *Seminars*, or classes for special research, are conducted for small groups of advanced students, and supply needed discipline in method. (See UNIVERSITIES; GERMANY, EDUCATION IN.)

The theological course ordinarily covers six semesters, or three years, though it often extends to four or five. Prussian students are required to take at least three semesters in the Prussian universities, but otherwise the choice is free, and it is not uncommon for students to divide their theological course between two or three, or even four, different universities. Attendance at the different universities differs widely from year to year, being dependent in no small degree upon the character of the teaching body at the time. In certain universities, such as Tübingen and Halle, there is always a large number of theological students. This is due in part to tradition, which leads fathers to recommend their sons to their own universities, in part to their possession of scholarships which are available for poorer students. In order to obtain admission to the university, a student must be a graduate of the classical gymnasium or, if a graduate of an *Oberrealschule*, must pass an examination in Latin, Greek, and Hebrew, which shows that he can read these languages. At the conclusion of his course he must pass a satisfactory examination. This is conducted partly by the faculty of the university, partly by the ecclesiastical authorities, partly by a joint commission in which both are represented. This examination is both oral and written. Theses are usually required and while tests vary in different localities a fairly good standard is maintained.

At the conclusion of his university course, the candidate for the ministry enters upon a period of practical training, either in a seminary (*Predigerseminar*), of which there are eighteen, or under a pastor, the purpose of which is to test his fitness for ministerial service. At the conclusion of this period, which varies from one to four years, a second examination is required, after which the candidate is open to appointment to some pastoral charge.

The seminaries are of two kinds, obligatory and optional. Among the former are Herborn, Friedberg, and Heidelberg, as well as Preetz, Hadersleben, and Schwerin. To the latter belong the seminaries of Old Prussia and Hanover, the *Predigerkollegium* at Leipzig, and the seminaries of Munich, Altenburg, Hofgeismar, and Wolfenbüttel. Attendance at the seminaries of the first group is required of all candidates for admission to the second examination. In their attitude toward this requirement, however, institutions vary. "Those of the old type treat those who attend them essentially as pupils, while those of the new type, like the optional institutions, allow wider scope for independent practical work and substitute conferences of the candidates for lectures. In consequence of their more elastic organization seminaries of the second, or optional, group may also admit such theological candidates as have already passed their second examination." (Cf. Schaff-Herzog, Vol. XI, p. 333.)

In the year 1910–1911 the Protestant students of theology in German universities numbered 2531. While this represents an increase over 1905–1906 when the figures were 2277, it is far below the figures of twenty years ago (4536). Much complaint is heard at the present time in Germany of the lack of a sufficient number of candidates for the ministry. Thus, in the year 1909 there were but 200 applicants for the first examination, and 163 for the second, instead of 300 and 260, which were required to supply the existing vacancies.

Students who approach the German system from the point of view of English and American Protestantism are struck by two points: first, the comparatively high intellectual standard required of German theological students; and secondly, the relatively small amount of time given to practical training, especially during the university course. In both respects the system has been criticized by Germans themselves, first on the ground that the unrestricted freedom of teaching in the university makes impossible that control of theological education by the church which is essential to unity of faith and action; and secondly, on the ground that the divorce of theory and practice during the years of university study unfits the student for the practical duties to which his life must be given. But, in spite of these objections, the prevailing system still commands the support of the great majority of Germans, and there is little likelihood of any radical change in the near future.

The German system is followed with slight variations in most of the countries of northern Europe, Norway, Sweden, Denmark, and Holland. In the first three countries Lutheranism is the established state religion, and the prospective ministers receive their training at the universities of Christiania, Lund, Upsala, and Copenhagen, respectively. There is also a seminary in Reikiavik in Iceland. In German Switzerland the established church is the Reformed, and there are faculties of Reformed theology in the universities of Zurich, Berne, and Basel, as well as at Geneva, Lausanne, and Neuchâtel in French Switzerland. There are also Protestant theological faculties at Vienna and Dorpat. Since 1866 the Baptists have maintained a theological seminary at Stockholm.

In Holland, where the established church is the Reformed, the situation is somewhat more complicated. Here theological differences have led to a large secession from the established church, and in addition to the state universities there are several independent schools of theology. As a result of liberal influence the theological faculties of the state universities were in 1870 changed into faculties of comparative religion. In 1876 they were relieved from the necessity of teaching confessional theology, and two professors nominated by the synod of the Reformed church were appointed to lecture on dogmatic and practical theology. In 1880 the free university at Amsterdam was founded under the auspices of the Christian Reformed church for the education of the ministry of that large and influential body. In addition to the university they have a theological school at Kampen founded in 1854, and the Lutherans and Baptists maintain their own seminaries.

The situation in France is complicated, partly by divisions between the French Protestants themselves, and partly by the fluctuations in the relations between church and state. The Reformed church is divided into three bodies: the Right, the Left, and the Center, and in addition the Lutherans are represented. Up to 1870 the Protestant ministry was educated at the three schools at Montauban, Geneva, and Strassburg. Strassburg under the influence of Reuss was long a leader in liberal thought. When Strassburg passed under the control of Germany in 1870 its place was taken by Paris, which under the leadership of Auguste Sabatier carried on the traditions of scientific scholarship. Montauban, reorganized by Napoleon I at the time of the Concordat, is the most conservative of the three schools. Since the disestablishment in 1905 it has passed under the control of the synod of the Reformed Orthodox churches in France. Paris has a mixed faculty, that is to say, it includes representatives of both the Reformed and the Lutheran church, and ministers to the needs of both.

During recent years the number of Protestant theological students has greatly diminished in France. In 1900 Montauban had sixty students, and Paris about as many. To-day Montauban has between thirty and thirty-five, and Paris between twenty-five and thirty. Geneva has from twenty to twenty-five. In addition to the three theological schools, French Protestantism has also two preparatory schools for young men too poor or too old to take the usual preparatory course. The first of these is at Batignolles in Paris, and the other in Nîmes.

Mention should also be made of the theological faculties of the free churches of Geneva, Vaud, and Neuchâtel in French Switzerland, as well as of the Methodist Seminary at Neuilly, and of the training schools of the Waldensians and of the Evangelical Italian church at Florence.

Great Britain and Ireland. — As regards ministerial education, Great Britain holds an intermediate position between Germany, where the system of state control prevails, and the United States, where seminaries rely for their support upon voluntary subscriptions. The explanation of this is found in the historical situation. At the time of the English Reformation, the ideal of all parties was of a state church, the only difference being as to its nature and powers. With the development of the Puritan movement and the reëstablishment of Episcopacy it was necessary for the various independent bodies to make provision as best they could for the education of their ministry. At first this was done through individual teachers, who received promising candidates into their homes. Among the best known of the men who conducted these home schools or academies, as they were called, were Charles Morton, Theophilus Gale, Thomas Rowe, Isaac Chauncey, Dr. Ridgeley, and John Eames. Richard Frankland, a tutor in the University of Durham under Cromwell, educated more than three hundred students, most of them for the Christian ministry. (See ACADEMY; DISSENTERS IN EDUCATION; also BIBLE IN THE SCHOOLS; RELIGIOUS EDUCATION.) But as time went on, the need of more systematic training was felt. And so there came into existence a number of institutions representing the different Protestant bodies and dealing more or less successfully with the problem of ministerial education. In recent times the defects of the present system have been keenly felt, and efforts have been made in various ways to reduce the number and increase the efficiency of the existing institutions. The most interesting example of this tendency is the creation by three of the leading universities, those of London, Manchester, and Wales, of theological faculties, with which the existing theological colleges are associated according to a plan to be presently explained.

In the Church of England the control of theological education rests in each diocese with the bishop whose function it is to prescribe the requirements for ordination and to see that they are complied with by the candidate. The result of this system led to great inequalities in training. While the church produced some great scholars, many men entered the ministry with the merest smattering of theological knowledge. In recent times a serious effort has been made to correct these evils by raising the standard of theological scholarship. Under the auspices of the Archbishops of Canterbury and York uniform requirements have been made for nongraduate students who desire to enter upon theological study, and provision made for their examination at local centers.[1] A further examination has also been provided for candidates for holy orders, which is open either to (*a*) graduates of the English universities, (*b*) members of theological colleges in connection with the Church of England who have entered on the last term of the complete course and are recommended by the principal, (*c*) any other person who may be nominated by the bishop with a view to ordination in his own diocese.

The center of theological education in the Church of England is the universities of Oxford and Cambridge. Each has a university faculty of theology, and in addition many of the colleges make provision for the theological instruction of their students. The Oxford University faculty consists of seven full professors and two university lecturers and, in addition, there were in 1912 twenty-two intercollegiate lecturers. The Cambridge faculty consists of seven full professors and twenty-one lecturers. Of the two, Oxford represents the High Church tradition while Cambridge has been the seat of critical scholarship. There is also a small theological faculty in connection with the University of Durham. All three universities give the degree of B.D. and D.D. on examination. Formerly these degrees were confined to members of the Church of England, but Oxford and Cambridge are considering opening them to nonconformists.

In addition to these university faculties of theology there are twenty-nine theological colleges of various sizes affiliated with the Church of England. The number of students varies from a dozen to fifty or sixty men, and the time of residence from one year to three. Several of these colleges, like the Clergy Training School at Cambridge, King's College in London, and the London College of Divinity at Highbury, are affiliated with adjacent universities. (See LONDON, UNIVERSITY OF.) The leading training school of the Episcopal Church in Ireland is Trinity College, Dublin (founded in 1591), which was disestablished in 1871.

The curriculum in the Anglican colleges includes the ordinary branches of theological study: Old and New Testament, church history, dogmatics and practical theology. Following the tradition of the English church chief attention is paid to patristics, and systematic theology is commonly taught in the form of a commentary upon the creeds and the articles. As between exegesis and philosophy, the emphasis falls upon the former, though Hebrew is not required of the ordinary student. In the universities provision is made for higher instruction, and Oxford and Cambridge have long been seats of productive scholarship. The institution of theological faculties at London, Manchester, and Wales has also tended to raise the standard of scholarship in the affiliated theological colleges.

Most of the theological colleges have residence halls, in which the students live together under a warden. There are numerous scholarship funds available for the assistance of candidates for the ministry. Most of the important dioceses have funds of their own, and in addition there are eight general funds available for interdiocesan purposes.

No complete statistics are available as to the number of students now preparing for the ministry. A table given in the *Official Yearbook of the Church of England* for the year 1911 puts the number of students at present in residence in fourteen of the twenty-nine colleges at 478. In addition there are doubtless many whose preparation is made privately.

Passing from the Church of England to the various nonconformist bodies, we find an even greater variety of conditions. Each of the leading denominations has its own group of colleges, owing their origin in most cases to local conditions, and varying widely in efficiency. The Congregationalists have eight colleges in England, of which Mansfield College at Oxford, Cheshunt at Cambridge, New College at South Hampstead, and Hackney College at Hampstead, are the best known. Besides the four colleges named there are institutions at Bristol, Bradford, Manchester, and Nottingham. Congregational students also study at the Carmarthen Presbyterian College and at the Memorial College at Brecon, and at the Bala Bangor Independent College in Wales. They have also a theological hall in Scotland. The number of teachers in 1909 in these different institutions was sixty-four, and of students, 442. (See *Congregational Year Book*, 1909, pp. 72–86.) The Wesleyan Methodists have four colleges grouped together under a single management as a theological institution. In addition they have a college of high repute at Belfast in Ireland. The primitive Methodists have one college in England; the United Methodists two; the Baptists six. In addition, the Baptists have two colleges in Wales, at Cardiff and Bangor, a theological college in Glasgow, and one in Dublin. The total number of students reported in 1909 in these institutions was 218. The Presbyterians are represented by Westminster College. The Presbyterian Church in Ireland has colleges at Belfast and Londonderry with 15 professors, and the Reformed Presbyterian, or Covenanter Church, has a theological hall at Belfast. The Unitarians have three colleges at Manchester, Carmarthen, and Summerville.

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[1] This examination covers Greek, Latin, Bible history, New Testament Greek, mathematics, and English history. It is conducted under the control of a council consisting of representatives of (*a*) the bishops of the two provinces, (*b*) the principals of theological colleges, and (*c*) examiners appointed by the two archbishops and the principals of theological colleges acting in conjunction (see *Official Yearbook*).

In recent years a number of attempts have been made to raise the standard of theological education in the different denominations. As early as 1879 Congregational colleges through their professors and representatives formed themselves into an association known as the Senatus Academicus, with this object in view. This body sought to establish a system of study and examination sufficiently thorough to command respect It secured the services as examiners not only of its own scholars, but of the best men in sister churches. The examination was divided into two parts, one leading to the degree of associate, and the other of fellow. And while few availed themselves of the higher test, a large number qualified for the former.

More important has been the tendency to concentrate the colleges at convenient centers and to seek university affiliation. Examples of the former were the removal of Mansfield and Manchester colleges to Oxford, of Cheshunt to Cambridge, and of New College and Hackney to Hampstead; of the latter, the extension by the universities of Manchester, Leeds, and Bristol of university privileges to local denominational colleges. By this means it has been possible to supplement the somewhat narrow curriculum of the college by studies in the university, and to raise the general standard of scholarship. Such institutions as Mansfield and Manchester occupy an honorable place in the scholarly world, and the standard which they require of their students is such as to enable their best men to compete on equal terms for the highest university honors.

The most interesting development in connection with theological education in England has been the establishment of undenominational faculties in connection with the universities of London, Manchester, and Wales. In each case the university prescribes a course of study both for the lower and the higher degree of divinity, and conducts the examinations of candidates. It further recognizes as associated colleges those theological schools in the neighborhood in which instruction is given of a character and a grade deserving of university recognition. Thus, in the case of the University of Wales any college is eligible for such relationship, which is located in Wales, which has four teachers giving instruction in subjects recognized by the university, and which for three consecutive years has had students presenting themselves as candidates for theological degrees. Six such colleges are recognized by the university, having a teaching force of twenty-nine men between them and having during the year 1911 thirty-nine students, candidates for degrees. The University of Manchester recognizes colleges of the Church of England, the Baptists, the Independents, the Moravians, the Unitarians, the primitive Methodists, and the Wesleyans. Among the colleges affiliated with the University of London mention has already been made of King's College and the Highbury School of Divinity (Anglican) and New College and Hackney College (Congregational). The Baptists and Wesleyans also have affiliated colleges.

From the earliest times the Scotch have attached great importance to the university training of ministers, and the standard of theological education has been, on the whole, high. The established church is the Presbyterian, but the various secessions which gave rise to the United Presbyterian and Free churches made necessary independent provision for ministerial education on the part of the seceding bodies. The recent reunion of the United Presbyterian and Free churches has led to a consolidation of their theological schools which has resulted in much saving of energy and money.

In the Church of Scotland (the Established Church) the theological halls, which are four in number, are associated with the universities (Glasgow, Edinburgh, St. Andrew's, Aberdeen), and no one can ordinarily be admitted to hall who has not passed through a prescribed course of study in the university. Until recently this included Latin, Greek, mathematics, logic, moral and natural philosophy, and English literature. But to-day, as the result of the elective system, greater latitude is allowed. Greek, Latin, and moral philosophy, however, are still insisted on, and, unless the student has taken his M.A. in these subjects, he must pass an examination in them before the examining board of the Church. An examination in New Testament Greek, the elements of Hebrew, and the English Bible is also required.

The theological course covers three years and includes the usual subjects of the seminary curriculum: systematic theology, apologetics, church history, biblical criticism, Hebrew, with Old and New Testament introduction. Courses of lectures are given in pastoral theology by ministers appointed by the Church, and instruction is provided in elocution and in some of the universities in church law. There are sixteen professors, four in each hall. In addition to the studies of the course, opportunity is given to the students for practical training in connection with the churches of the cities. Recently residences for divinity students have been established by the Church at Edinburgh, Glasgow, and Aberdeen, where they have the benefit of a comfortable home and some social advantages at a moderate charge for board. There are many bursaries and scholarships, and the Carnegie Fund relieves theological students of the necessity of paying university fees.

The system of instruction in the United Free Church is very similar, except that the course covers four years instead of three. There are three colleges at Edinburgh, Glasgow, and Aberdeen, with sixteen professors. There is also a professor of natural science, who serves Edinburgh and Glasgow jointly, a position created for the late Professor Drummond, and a lectureship of natural science at Aberdeen. With this exception the chairs are the same as in the Established Church.

The number of students in the two churches is about three hundred, a considerable falling off from previous years. The recent negotiations which have resulted in the union of the United and Free Churches have led many to question whether a further union of the Scotch Presbyterians is not desirable and practicable. Among the influences leading to this conclusion, the wastefulness of the present system, providing as it does two competing groups of institutions for only 300 students, is one of the most convincing.

Canada and Australia. — The tendency already noted in Great Britain toward a more economical distribution of the existing facilities for theological education reappears in accentuated form in Canada. Here we see a number of denominational colleges, many of them small in numbers and resources,[1] grouped about the leading universities and seeking closer affiliation with them. Thus, in Toronto, the Presbyterians, Anglicans, Catholics, and Methodists are represented; in Montreal, the Presbyterians, Episcopalians, Congregationalists, and Methodists. In the University of Toronto, a state institution, courses given in the various denominational colleges are recognized as university electives in the sphere of religious knowledge, and count for the university degree. In Montreal an interesting experiment of interdenominational coöperation has just been inaugurated through the union of four independent colleges, the Presbyterian, Congregational, Methodist, and Anglican, into a single strong college affiliated with the university. This experiment, the first of the kind outside of the mission field, will be watched with interest by all those who are responsible for theological instruction.

The Australian system, like the Canadian, consists of a group of denominational colleges affiliated with the university. Thus at Sydney and Melbourne, the Presbyterians, Episcopalians, Congregationalists, and Methodists have theological colleges; at Adelaide the Episcopalians and Methodists, while there are Episcopal colleges at Armadale and Victoria.

United States. — The outstanding feature in connection with ministerial education in the United States is the complete separation of Church and State. With this exception, all the different tendencies which we have noted in our earlier survey reappear here. Each of the leading divisions of Christendom has its representative on this side of the water, perpetuating the traditions and sentiments of the parent stock. To a much greater extent than on the Continent of Europe the denominational ideal has determined the history, and controlled the development of American theological education. To follow the history in detail would transcend the limits of this article. Only the most important points can be briefly touched on.

From the first, the American colonists insisted upon an educated ministry. Most of the earlier ministers received their professional training in the old country, but the need was soon felt of making independent provision at home. The oldest American universities, notably Harvard and Yale, were founded in large part to provide suitable ministers, and the curriculum included, with logic, mathematics, and classics, such distinctly theological subjects as Hebrew and dogmatic theology. As time went on, and the number of students increased, the custom arose of having those who were candidates for the ministry return for one or two years of postgraduate study. To care for these men professorships of divinity were established (*e.g.* in Harvard in 1721; in Yale in 1755) and many notable men (*e.g.* Jonathan Edwards) received their theological training in this way. The organization of distinct theological departments did not take place till the next century — at Harvard in 1819, at Yale in 1822. (See College Graduates, Professional Distribution of.)

Toward the middle of the eighteenth century the custom arose for ministerial candidates to go into residence in the families of eminent divines, for the purpose of studying under their special direction. The first to undertake this work was Dr. Joseph Bellamy, of Bethlehem, Conn., who during his long and successful ministry could boast of having had under his care more than sixty students. Other well-known teachers were Dr. Hart, Dr. Smalley, Dr. Samuel Hopkins, and Dr. Nathaniel Emmons. The latter is said to have taught more than one hundred students.

The first religious denomination to make provision for denominational theological instruction was the Dutch Reformed Church, which in 1784 appointed Dr. John H. Livingston, the pastor of the Collegiate Church in New York City, to be professor of divinity in the Church at large. He was assisted in this work by other ministers of the denomination, but all students were required to have an examination, and receive a license from him, before being allowed to preach. In 1810 Dr. Livingston removed to New Brunswick, and became president of Rutgers College, and professor of theology therein.

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[1] Thus the Presbyterians in Canada have six colleges (Halifax, Montreal, Queen's, Knox, Manitoba, and Westminster Hall), with thirty professors and sixteen lecturers, while the total enrollment of students in 1911 was one hundred and fifty-five.

The next to follow were the Roman Catholics, who in 1791 established St. Mary's Seminary in Baltimore, the United Presbyterians who founded a Seminary at Service, Penn. (now at Xenia, Ohio). in 1794, and the Lutherans, whose Seminary in Otsego County, N.Y. (Hartwick), can trace its ancestry uninterruptedly to the founding of a school for the education of the Indians by Rev. John Christopher Hartwick in 1797.

In 1807 the orthodox Congregationalists founded a seminary at Andover, Mass., to counteract the Unitarian tendencies of Harvard. The Presbyterians established Princeton in 1812, the Episcopalians the General Theological Seminary in 1819, the Baptists Hamilton Theological Seminary in 1820, and the Methodists a seminary at Newbury, Vt., in 1847. Others rapidly followed, till in 1902 there were in the United States no less than 150 theological schools with a teaching force of 1034, 7343 students, and 1656 graduates.

According to the *Report* of the Commissioner of Education for 1911, there were in that year reporting to him 193 Schools of Theology in the United States with 10,831 students, including 467 women. These schools were distributed as follows: North Atlantic States, 55; Southern Atlantic States, 24; Southern Central States, 27; North Central States, 75; Western States, 12. They had a teaching force of 1118 regular professors and 387 others. Of the 10,834 students, 3266 had a college degree. 1877 were graduated, including 50 women. The endowment of these institutions aggregated $35,313,101, of which $21,419,790 was represented by buildings. The income was $3,399,286. The volumes in the libraries numbered 2,304,059. The denominational distribution of these different institutions is as follows: Roman Catholic 33, Lutheran 23, Methodist 29, Presbyterian 22, Baptist 21, Protestant Episcopal 12, Congregational 9, Disciples and Christians 9, Reformed 7, Universalist 3, Unitarian 2, Jewish 2, others 10. 11 are classed as undenominational.[1]

A study of the different institutions included in this list reveals the fact that there is a wide variety in the constituency served, the character of the instruction given, the standard required, and the method of control. Some institutions were founded for missionary purposes, others in the interest of a rigid orthodoxy; in still others the scientific interest is controlling. Some require a college diploma for entrance, others take men of high school or even lower grade; some, like the Roman Catholic, Lutheran, and Christian seminaries, include preparatory departments of college grade; others have well-developed graduate schools of university character. Some are independent institutions under self-perpetuating boards; others are under strict denominational control, their teachers being appointed either directly by the ecclesiastical authorities or by boards directly responsible to them; still others have close university connection, either as being themselves university departments (as Harvard, Yale, and Chicago), or (as with Union and Andover), while independent in government, having intimate academic relations with a contiguous university.

It is evident that before any intelligent account can be given of the present state of theological education in this country a distinction must be made between the different groups thus roughly indicated. But accurate statistics are not available for this purpose. The report of the Commissioner of Education makes no attempt to discriminate between different kinds of institutions. The catalogues of the institutions themselves give lists of courses and requirements, but afford no test of the thoroughness with which the alleged requirements are met. Much information may be gained from an article on theological education in the last edition of Schaff-Herzog (XI, p. 343 *sq.*), where an account is given of 95 different Protestant institutions. But here again there is no attempt at uniformity of treatment, and many of the most important questions are left unanswered. There is great need of a comprehensive study of theological education in the United States similar to that recently published by the Carnegie Foundation on medical education.

In general, the theological schools in the United States may be divided into three groups: (1) graduate schools in the strict sense of the term, *i.e.* schools which are designed primarily for professional training, and which therefore presuppose a college course or its equivalent,[1] (2) mixed schools, *i.e.* schools which combine academic and theological training as parts of a single curriculum,[1] (3) non-professional schools for the training of religious workers, like the Young Men's Christian Association training schools.

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[1] In estimating these figures these facts must be taken into account: first, that they include Roman Catholic as well as Protestant institutions; secondly, that they do not discriminate between theological seminaries proper and schools for the training of lay workers and Y. M. C. A. secretaries. Thirdly, that they include a number of institutions which have preparatory departments. This fact doubtless accounts in part for the large number of students who hold no college degree. Fourthly, that there are doubtless other schools which failed to make report.

[1] Such graduate schools may be either independent institutions or distinct departments of universities or colleges. Professor Burton in a careful statistical study of the present supply of men for the ministry (*The Materials of Religious Education*, 1907, p. 60) counts 58 such schools classified as follows:

11 Presbyterian (Princeton, Auburn, Western, Lane, Union, N.Y., Theol. Sem. of Ky., McCormick, San Francisco Theol. Sem., Union Theol. Sem. of Va., Cumberland Univ., Pres. Theol. Sem. Omaha).
3 Reformed Pres. and United Pres. (Xenia Theol. Sem., Ref. Pres. Theol. Sem. Allegheny, Allegheny Theol. Sem. U.P.).

Confining our attention to graduate schools, we find that the seminaries in the United States may be divided into two groups: those whose primary object is to train the ministry of a particular denomination, and those which aim to give an undenominational, or, better still, an interdenominational training. To the former still belong the great majority of the seminaries of the country. But the tendency to emphasize the things which Christians have in common above those which divide them is increasingly manifest, and not a few institutions of a strictly denominational character open their doors to students of other communions, and, in certain cases, even admit representatives of other churches to their teaching force.[2] This is particularly noticeable in the case of those institutions which have university affiliation,[1] or like Yale, Harvard, and the University of Chicago, constitute university departments. Worthy of special mention as illustrating the tendency to a broader conception of theological education is the recent history of four institutions, each originally of strictly denominational character: the Baptist Seminary in Chicago, the Harvard Divinity School at Cambridge (Unitarian), the Congregational Seminary at Andover, and Union Theological Seminary in New York (Presbyterian). In the first case a denominational school under an independent board of trustees, having become the theological department of a great university, has thrown open its doors to students of all denominations and maintains a large and effective summer school of theology attended by many students of both sexes. In the second case we see a school whose teaching force had long been restricted to a single denomination (the Unitarian) adding to its faculty teachers of other communions, and so realizing the comprehensive ideal to which its position as the theological department of a great university predestined it. In the third case a denominational school, originally founded to combat a particular heresy, after a hundred years of independent and isolated existence, has removed from Andover to Cambridge and, while preserving its own autonomy and separate institutional life, has entered into relations of friendly coöperation with its ancestral rival. In the last case a seminary originally founded by members of a single church (the Presbyterian) and still preserving and valuing its spiritual inheritance, has abolished denominational subscription on the part of its teaching force and included within its faculty representatives of no less than five of the leading communions of Christendom.[2]

This action in the case of Union Theological Seminary is particularly significant because in spite of its close university affiliation it remains an independent institution primarily concerned with the training of ministers for the service of the churches. The enlargement of the faculty, the broadening of the curriculum, and, in general, the shifting of the point of view from a single denomination to the church at large have taken place not more in the interests of intellectual efficiency than of practical adaptation to the existing situation, and the presence in this single school of

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8 Lutheran (Theol. Sem. of United Synod, Evang. Luth. Sem., Susquehanna Sch. of Theol., Lutheran Theol. Sem., Theol. Sem. of Evang. Luth., Luth. Theol. Sem. Gettysburg, Pa., Wittenberg Theol. Sem., Evang. Luth. Theol. Sem. Wawatosa, Wis.).
8 Cong. and United Brethren (Andover, Bangor, Chicago, Hartford, Oberlin, Pacific, Union Biblical Sem., Dayton, O., Yale).
7 Baptist and Free Baptist (Colgate Theol. Sem., Crozer Theol. Sem., Univ. of Chicago, Newton Theol. Inst., Rochester Theol. Sem., Southern Baptist Theol. Sem., Cobb Divinity School).
4 Methodist (Boston Univ. School of Theol., Drew Theol. Sem., Garrett Biblical Inst., Vanderbilt Univ.).
6 Episcopal (Berkeley, Conn. Div. Sch., Gen. Theol. Sem. N.Y., Seabury Div. Sch., Western Theol. Sem., Theol. Sem. Cambridge, Nashota House).
3 Universalist (St. Lawrence Univ., Ryder Div. Sch., Tufts College).
2 Unitarian and Undenominational (Meadville Theol. Sem., Harvard Divinity School).
6 Reformed (Theol. Sem. of Ref. Church, Lancaster, Pa., Theol. Sem. of Ref. Church in America, New Brunswick, N.J., Heidelberg Theol. Sem., Western Theol. Sem. Holland, Mich., Ursinus Sch. of Theol., Mission House, Franklin, Wis.).

Of these some classified as denominational institutions, *e.g.* Union, Yale, and the University of Chicago, are interdenominational in their constituency. Others are far from realizing in fact the ideal of graduate institutions, as appears from Professor Burton's statement (p. 58) that in certain of the schools included in his list "the college graduates are not more than one third of the whole number."

[1] Such is the case with many Catholic institutions. Among the Protestants the system is especially prevalent among the Lutherans and the Disciples. A significant statement as to the point of view which still dominates some of the theological teaching of this country is the following: "Ministers should be Christian workers trained for their calling in religious institutions, not in secular colleges. They should be so educated as not to become a caste estranged from the people in general, and especially not from believers in the church. The essential medium for the spiritual development of young men being educated for the ministry should not be the Græco-Roman classical literature, imbued as it is with pagan ideas and immorality, but the Word of God" (George Sverdrup, Jr., in an article on Augsburg Theological Seminary, in Schaff-Herzog, XI, p. 357).

[2] *E.g.* Auburn Theological Seminary (Presbyterian), where the Professor of Systematic Theology is a Congregationalist.

[1] *E.g.* Union Theological Seminary in the city of New York which under an arrangement with Columbia University and the University of New York opens its courses to students of these institutions without charge in return for the extension of similar privileges by them. Similar arrangements obtain in a number of other institutions (Andover with Harvard, the Philadelphia Divinity School with the University of Pennsylvania, etc.).

[2] Presbyterian, Congregational, Episcopal, Methodist, and Baptist.

representatives of many Christian communions studying side by side is the best evidence that the new method is finding an increasing response on the part of the churches.

The prevailing length of the theological course in the United States is three years, though a few institutions require only two, and others four or even longer.[1] Measured in weeks, the course usually occupies from ninety to one hundred and twenty weeks, the long summer vacation being used by many of the students for practical work in connection with the churches which they serve. The theological department of the University of Chicago is in session continuously, its year being divided into four quarters of twelve weeks each. Some seminaries give the degree of B.D. on graduation, others simply the diploma, while still others regard the degree as an honor to be awarded to advanced students who have completed a special course or attained a specified grade.

Most of the theological schools in the United States have residence halls in which the students live during the seminary course. In some cases, as at Auburn, the General Seminary, etc., the students eat together in a common hall. Tuition is ordinarily free, a moderate charge being made for light and heat, the only exceptions being Harvard, the University of Chicago, Andover, the Episcopal Theological School at Cambridge, and the College of the Bible, in all of which tuition fees are charged.[2] A liberal provision is made for scholarship aid, which is variously administered, either as a gift on the basis of need (so the great majority), as compensation for work done, as a loan, or for excellence of scholarship on a graded merit system.

A characteristic of theological education in the United States is the emphasis laid upon practical training during the seminary course, especially in those institutions which are in or near large cities. At Union in New York a very large proportion of the student body is engaged in the practical work of churches, settlements, or philanthropic institutions under the direction of the faculty. The same is true of many other institutions. The danger of distracting the student's interest from his studies is recognized, but on the whole the advantages of the system seem to overbalance its defects.

Comparing the statistics of attendance at our seminaries during the last thirty years,[3] it appears that from 1880 to 1895 there was a very large increase of students, amounting to nearly one hundred per cent, whereas in the years from 1895 to 1907 there was a considerable decrease. At present this decline seems to have been checked, and the most recent figures show a gradual but slight increase. The reasons for this variation have been much discussed, and opinions differ as to the cause. By some the falling off in the number of students has been attributed to the results of the competition of other professions and interpreted as marking a permanent change in the attitude of thoughtful men toward the ministry. Others regard it simply as the natural reaction from the exaggerated increase of the period from 1880 to 1895. While there is doubtless truth on both sides, the weight of evidence in view of the most recent figures available would seem to point in the latter direction rather than in the former.

Besides the theological seminaries, in the technical sense, there are many institutions in the United States which provide training for religious workers. Most prominent among these are the Training Schools of the Y. M. C. A. at Springfield and the Y. W. C. A. in New York, the Bible Teachers' Training School in New York, and the various Deaconesses' Schools and other institutions for the training of lay workers. Statistics as to the number of such schools are not available, but recent investigation has disclosed the existence of more than forty,[1] and the list is doubtless incomplete. As the demand upon the Christian church increases and its forms of service are more highly specialized, the need of adequate training for all who take part in its ministry becomes increasingly manifest. This need is already being recognized by our theological seminaries, some of which are making provision to meet it through special courses, and in some cases through independent departments.[1]

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[1] Of the 184 schools reporting to the Commissioner of Education in 1910, 1 offered a one-year course, 12 a two-year course, 121 a three-year course, 20 a four-year course, 3 a five-year course, 16 a six-year course, while 2 offered eight, nine, and eleven years respectively. It is to be remembered, however, that these figures include Roman Catholic institutions, in which the normal theological course is six years, as well as other institutions which include preparatory departments of two or more years.

[2] At Harvard and Andover $150, at the University of Chicago $120, at the Episcopal School at Cambridge $50, and at the College of the Bible $45.

[3] The most careful statistics on this subject have been compiled by Prof. Burton (*The Materials of Religious Education*, 1907, pp. 55 *sq.*). His tables, which include 58 graduate schools of theology of ten different denominations, show that in 1880–1881 there were in attendance 2150 students; in 1889–1890, 3112; in 1894–1895, 4001; in 1895–1905, 3381; in 1905–1906, 3310; and in 1906–1907, 3267. The latest student of the subject, President Pritchett, in his Sixth Annual *Report* for the Carnegie Foundation, is led to conclude that since 1905 the supply of theological students has increased more rapidly than the population (pp. 96–99). Cf. also Perry, The Decline in the Number of Students for the Ministry (*Rel. Edu. Ass.* 1905, pp. 135 *sq.*).

[1] This figure is based upon investigations made by G. S. White for the Religious Education Association. Of the 32 schools discussed in his paper (unpublished) 7 are in New York, 5 in Illinois, 4 in Pennsylvania, 4 in Tennessee, 3 in Massachusetts, 2 in Ohio, 1 each in Connecticut, Maryland, Oklahoma Indiana, Kentucky, Missouri, and Minnesota. The denominational distribution is as follows: Congregational 4, Disciples 4, Baptist 3, Methodist 1, Presbyterian and Reformed 2, Lutheran 2, Protestant Episcopal 1, undenominational 9. Three are connected with the Holiness Movement. The total number of professors, instructors, and regular lecturers reported is 335. The number of students (8 schools not included) 2411. Thirteen admit only women, three only men. There is wide variety in the subjects and methods of instruction, but fully 80 per cent make special provision in the curriculum for some form of training in social service.

A problem of peculiar importance to the church of America is that of the provision of an educated ministry for the ten million American negroes. A few of the more promising candidates receive their training in the leading seminaries of the North, but the great majority are taught in southern schools, such as Lincoln, Biddle, Gammon, Taladega, Virginia Union, etc., maintained by the different churches for the purpose.[2] While the standard in many of these schools is good, and conditions on the whole improving, the opportunities are less than in corresponding schools for the white ministry, and at best the existing schools can furnish but a small portion of the ministers needed.[3] There are still many negro preachers who do not receive any theological education at all, in the accepted sense of the word, and it is clear that if the needs of the negro church for intelligent leadership are to be adequately met, the problem of ministerial education for the colored race must receive more attention than has yet been given to it by the church at large.

More recent in its origin, but scarcely less important, is the problem of providing a ministry for the foreign-speaking population which is pouring into this country in such vast numbers. There are a few institutions,[4] which are specially designed for the training of a foreign-speaking ministry. Some seminaries have departments in which a foreign language is used,[5] but the supply is far short of the demand, and there is urgent need of far-sighted statesmanship and intelligent coöperation among the leaders of the home church in providing adequate facilities for meeting the common need.[1]

A word should, finally, be said as to the theological education of women. The great majority of the churches still bar their ministry to women, and the numbers of women who are regular students of theology is small. It is, however, increasing, and many of our seminaries now admit women to the regular courses and grant them their diploma and degree. This change is due to several causes: first, the demand for women as teachers of theology and of the Bible in our colleges and girls' schools; second, the need of well-trained women as deaconesses, minister's assistants, and parish workers; third, the increased interest of the general public in theological and religious questions which leads not a few to undertake the study of religion for its own sake. Unless all signs fail, these influences are likely to operate more powerfully in the course of the next few years, and the number of women students of theology should show a corresponding increase.

Apart from the ordinary means of theological training open to men and women alike provision is made for the religious training of women in a group of institutions specially designed for them, such as the training schools for deaconesses conducted by the Episcopal church and the training school of the Young Women's Christian Association. One of the encouraging signs of the time is the marked improvement in the standards required in these institutions. While limited in amount the instruction is often excellent in character, and the quality of the student body is constantly improving.

Ministerial Education on the Mission Field. — Within a comparatively short time modern missions have entered upon an entirely new phase. The pioneer period when all the energies of the missionary were devoted to winning a few individual converts is over, and in each of the leading countries of Asia there are numerous well-attended institutions, conducting an extensive educational work, and having for their aim not merely the conversion of individuals, but the modification of the entire social fabric of the country in which they are located. It is inevitable that under these new conditions the problem of ministerial education on the foreign field should acquire a constantly increasing importance. (See MISSIONS, EDUCATIONAL ASPECT OF MODERN.)

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[1] *E.g.* the Hartford School of Religious Pedagogy and of Missions.

[2] At the present time there are 28 different institutions exclusively for the theological training of colored men, divided as follows: Baptist 8, Methodist 10, Presbyterian 4, Protestant Episcopal 1, Congregational 1, Interdenominational 2. The Howard University of Washington maintains an interdenominational school.

[3] An experienced observer who has firsthand knowledge of the subject concludes that out of 20,000 negro ministers at the present time, probably not more than one third and possibly not more than a fourth have attended any theological school.

[4] *E.g.* the Schauffler Training School at Cleveland, the Finnish Theological School at Cambridge, the German and Swedish seminaries of the Methodists, and the Presbyterian seminaries at Bloomfield and Dubuque. The two latter, originally designed simply for Germans, have recently enlarged their scope so as to include Italian, Hungarian, and Bohemian departments.

[5] *E.g.* Garrett Biblical Institute, Norwegian-Danish Department; Oberlin, Slavic Department; Chicago Theological Seminary, Danish, Norwegian, and Swedish Department; Redfield College (S.D.), Russian-German Department; Western Theological Seminary, Bohemian, Hungarian, and Italian Departments; Rochester Theological Seminary, German Department; Colgate Theological Seminary, Italian Department. In addition, the Bible Teachers' Training School in New York and the Christian Workers' Training School at Springfield make special provision for the training of foreigners. Cf. Special *Report* of the Board of Education of the Presbyterian Church, U.S.A., on the training of ministerial and lay workers among people of foreign speech in America. 1909.

[1] Recently the Presbyterian church, U.S.A., through its Home Board, has established a number of Immigration Fellowships, open to graduates of theological seminaries, enabling them to spend a year or more in Europe in study of the home conditions of the immigrants, with a view to special service in immigrant communities after their return.

The fullest statistics as to the number and character of theological training schools on the mission field are to be found in the *World Atlas of Christian Missions*. From this it appears that there were in 1910 in the different mission fields more than 500 different institutions, with a total enrollment of between 12,000 and 13,000 students.[1] Unfortunately, the table given does not distinguish the strictly theological or divinity schools from the normal schools for the training of evangelists, teachers, Bible women, and others engaged in religious instruction. Often both kinds of instruction are carried on in the same school, and the standards required of the prospective minister vary widely in the different countries and churches. When every allowance is made, the figures show that we are dealing with an enterprise of no slight magnitude and importance.

Theological schools on the mission field are of two kinds: first, strictly denominational institutions established by the various Missionary Boards and either under their direct control or that of boards of trustees responsible to them; second, interdenominational schools conducted jointly by representatives of two or more different denominations. One of the striking features of recent missionary history has been the growth of the tendency to practical coöperation in the higher branches of education, but in the case of theology the difficulties have proved so great that less progress has been made in this department than along other lines. In view of the differences in the history and traditions of the different churches, it is not easy to find a common platform on which all alike can stand. It is a significant fact that the leading undenominational institutions of high grade, such as Robert College in Constantinople, the Canton Christian College in China, and the Syrian Protestant College at Beirût, have as yet made no provision for distinctly theological instruction in their curriculum.

It is all the more significant that in spite of these difficulties so much should already have been accomplished. There are at the present time upon the mission field no less than sixteen different theological institutions of an interdenominational character. As might be expected their distribution is uneven, those countries where the intellectual standard is highest, and the demands of the educational problem most insistent, taking the lead. Thus, we find that China has nine such institutions,[2] Japan three,[3] India two,[4] Syria one,[5] the Philippines one.[5]

Apart from the difficulties which result from ecclesiastical division, the chief problems which meet those responsible for theological education in the foreign field are of two kinds: (1) those which have to do with the relation of the theological institutions to the home base, and (2) those which have to do with the adaptation of western methods and traditions to the new environment. How far can the conduct of the school be safely left to those who are on the ground, and how far should the authorities at home retain the management in their own hands? How far may native assistance be wisely employed in the teaching force or in the direction of the school? How far should the desires and prejudices of the constituency which the school is designed to serve be considered? How far should the attitude of the institution be hospitable to the teaching of the older religions and how far should the distinctive character of Christianity be insisted upon? These questions are differently answered by different persons, but their presence and importance are recognized by all who have to do with missionary education in the East.

A new impetus has been given to the discussion of these questions by the recent Missionary Conference in Edinburgh. One of the eight commissions of this conference was devoted to education, and much valuable information was gathered. Even more significant in its promise for the future was the careful and sympathetic study of the message of the ethnic faiths made by the third commission. Most important of all was the hearty welcome given to all proposals for coöperation in connection with the discussion of comity, which gave a powerful impetus to the movement referred to above, toward the establishment of interdenominational theological schools.

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[1] Of these India had 141 with 3755 students, China 129 with 2544 students, Japan 37 with 619 students, Korea 10 with 860 students, Turkey 6 with 58 students, Syria and Palestine 5 with 115 students, Africa 103 with 2440 students, South America 18 with 158 students, Madagascar 13 with 313 students, Ceylon 7 with 68 students.

[2] 1. The Theological Seminary of the North China Educational Union, Peking (Presbyterian, Congregational, Am. & Eng., Methodist, U.S.A.); 2. Theological department of the Shantung Christian University (Presbyterian, U.S.A. and Baptist, Eng.), 3. Union Theological School of Amoy (Ref. Ch. U.S.A., Eng. Presbyterians and Eng. Congregationalists); 4 Union Theological Seminary at Canton (Presbyterians U.S.A., Presbyterians New Zealand, Presbyterians of Canada, Am. Congregationalists); 5. Union Theological Seminary at Nanking (Presbyterians U.S.A., North and South, United Brethren, Am., Congregationalists U.S.A.); 6. Union Theological College at Moukden (United Free Church of Scotland, and Irish Presbyterians); 7. Union Theological Seminary at Niekow (Norwegian Miss. Soc., Hange's Synod Mission, Finnish Miss. Soc., American United Norwegian Lutheran Mission); 8. Union Theological Seminary at Kingchowfu (Swedish Miss. Soc., Swedish Am. Miss., Covenant Mission); 9. Theological College of the Union University at Chengtu, West China (Methodists U.S.A., English Friends, Canadian Methodists, Baptists U.S.A.).

[3] The Meiji Gakuin (Presbyterian and Dutch Reformed, U.S.A.), The Aoyama Gakuin (Methodist U.S.A. and Canada), Central Theological College in Tokyo (Anglican and American Episcopal). In addition, mention should be made of the Doshisha, an independent theological school founded by Joseph Neesima.

[4] 1. Saharanpur Theological Seminary at Saharanpur (Presbyterian Church in India representing Presbyterian missions of America, Scotland, England, Ireland, and Canada); 2. Union Theological College of South India at Bangalore (Ref. Dutch Mission, U.S.A., London Mission, United Free Church of Scotland, American Board, and English Wesleyans).

[5] Theological Seminary of the Syrian Missions, Beirût, Syria (Presbyterian — to be reorganized on an interdenominational basis).

[6] Union Bible Seminary at Manila (Presbyterians U.S.A., Methodists U.S.A., United Brethren U.S.A.).

Problems in Ministerial Education. — These are of three kinds: those which affect (1) the subject matter and the method of theological education, (2) the constituency to be served, and (3) the method of control. In what follows we shall confine our discussion largely to conditions in the United States.

The Problem of Educational Matter and Method. — The method of theological education in the Protestant seminaries of fifty years ago varied little. In each there was a required curriculum embracing the four divisions of theological science as then understood — exegetical theology, historical theology, systematic or dogmatic theology, and practical theology. In connection with exegetical theology selected portions of Scripture were read by the class, and their theological and practical significance explained. In the best seminaries much time was also given to the study of Hebrew and Greek, as the original languages in which the Scriptures were composed. Historical theology occupied relatively little time and consisted ordinarily of a brief survey of the history of the church, with special reference to the particular branch to which the institution belonged. Systematic theology occupied the center of the curriculum and consisted of an elaborate statement of the doctrinal position of the church or denomination in question, together with its defense against opposing views within and without the church. The method of treatment followed closely the lines laid down by Butler in his *Analogy;* revealed theology, which dealt with the doctrines of supernatural religion, being preceded by natural theology, whose office it was to treat of what could be known of God by reason. Practical theology finally, as the name implies, had to do with the practical training of the student for the pastoral office, chief attention being given, in the non-liturgical churches, to the preparation of the sermon, and in the Episcopal churches to the liturgy and prayer book.

More significant than the subjects taught was the point of view that dominated the instruction. It was the main object of the theological teacher to confirm the students under his care in a definite set of beliefs, to enable them to defend these against opposing views, and to give them such practical training as would fit them for their office as preachers and teachers. This being the case, originality on the part of the student was discouraged. The method ordinarily followed was that of textbook and recitation, and had the merits and defects of this system. There were no doubt important differences both in the content of theological teaching and in its emphasis. Apart from the denominational differences to which reference has just been made, the fundamental contrast between the liberal and the conservative could not but have its effect upon the character of theological instruction. Nevertheless it is true that taking theological education as a whole, the seminary of a generation ago presents us with a type compact and definite enough to make a convenient basis of comparison.

Judging by this standard, we see marked changes, both in the subject matter and in the method of theological education. These changes are the result of a number of influences, in part intellectual, in part practical. Among the more important may be mentioned the influence of modern science which has so profoundly affected educational method all along the line; the new social spirit with its enlarged conception of the function of the church; a better acquaintance with the ethnic faiths, as a result of the more intimate contact of the mission field; and, last but not least, the birth of a science of education which has subjected the older methods of instruction to the test of a scientific analysis in the light of the new psychology. The effect of these influences upon the curriculum of the seminary is already marked. It affects both the matter and the method of instruction: — the former by the introduction of an ever increasing body of new material not provided for in the older curriculum; the latter by the presence of a new point of view in dealing with the material treated, whether old or new.

Among the new subjects which are beginning to be met with in the curriculum of the modern seminary may be mentioned comparative religion, religious education, sociology, and missions. Within the ground covered by each of the older divisions new subdivisions are recognized. In the Biblical department we have Introduction to the Study of the Bible, the history of Israel, the life of Jesus, the contemporary history of New Testament times, Biblical theology in its various divisions and subdivisions (*e.g.* the religion of Israel, the teaching of Jesus, the teaching of Paul, etc.). In place of a single course in church history we find courses in separate periods, the ancient church, the medieval church, the reformation, the modern church, the church history of separate countries and sects, the history of doctrine, or the teaching of particular theologians. In place of the older natural theology, we find courses on the psychology and the philosophy of religion; and the systematic theologian in the narrower sense finds himself compelled to deal with a host of new questions, historical, psychological, and philosophical, not touched on in the older textbooks. Symbolics or comparative theology acquires a new importance and is transformed from a study of the creeds of the past into an attempt to interpret the genius of the existing types of Christian faith and life. Most marked of all is the expansion of the practical department. Here we see a mass of new material growing out of the social changes of the last generation. The new philanthropy in its various forms, organized charity, prison reform, the settlement movement, the labor movement, socialism, the immigration problem, the problem of the country and the city — these are but a few of the many subjects which make their demand upon the time and thought of the theological teacher and student.

Nor is it simply that there are so many more things to be studied; the method of approach is rapidly altering. What we call the scientific spirit, or, in other words, the spirit of orderly, impartial, systematic observation and induction, is more and more making its presence felt in theological instruction. The methods employed with success in other departments of historical investigation are being used to-day in the study of the Bible and of church history, with a result that many opinions formerly accepted without question have been challenged, and the question how to reconcile the theological legacy of the past with the new knowledge of the present becomes ever more pressing.

This change in the method of approach has necessitated corresponding changes in the method of instruction. Lectures aiming to cover the entire field have superseded, or at least largely supplemented, the method of textbook and recitation, and the use of seminars, or research classes, for the first-hand study of the sources is increasing. The range of election has been largely extended, and the compact groupings of the earlier seminary with its sharp class distinctions are being replaced by more flexible divisions.

The problem which here faces the seminary is the same in principle as that which challenges all our education. How can we organize the enormous mass of new knowledge which we have been acquiring within recent years in forms that are effective and practical? What substitute can we provide for the discipline of the required curriculum which in so many quarters has been abandoned or threatened? It is indeed contact with the university [1] which has forced this problem upon the seminary, and the solutions which are being sought by theological teachers here and across the sea follow the lines which have already been marked out by university teachers in other branches. On the one hand, we have the advocates of unrestricted election;[2] on the other, those who think they can deal with the situation, through the revision of the required curriculum. Between the two there are various intermediate plans, such as that of a group system of parallel studies,[1] or that of a core of required studies followed by a wide range of unrestricted election.[2] Specially pressing in the seminary as in the university is the question of linguistic study. As university teachers have raised the question whether the classics are still necessary for an effective general education, so theological teachers ask whether, in the pressure of new subjects, it is still wise or even possible to insist upon all theological students studying Hebrew and Greek.[3]

There is, however, one difference between the problem of the seminary and that of the university. As a strictly professional school, the seminary must always have in mind the constituency which it is designed to serve. Whatever variations may be admitted into its curriculum must answer to the real needs of the church of which its graduates are ministers. Some subjects are prescribed by the ecclesiastical body itself. Others grow naturally out of the existing situation in the churches. It is clear, then, that no discussion of theological education can be intelligent that does not take this situation into account.

The Problem of Practical Adaptation. — The conditions under which the modern minister enters his work are very different from those which faced his predecessor a half or even a quarter of a century ago. Then the work of the minister was comparatively simple and relatively uniform. His position in the community was recognized, his duties clearly defined, and the training which he received in the seminary was, on the whole, well adapted for its purpose. But to-day the situation has changed. New conditions confront the church.

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[1] To the 150 courses offered in the Union Theological Seminary, the affiliated universities, Columbia and New York University, add as many more on subjects germane to the theological curriculum. Similar conditions exist in the case of universities with theological departments, such as Harvard, Yale, and the University of Chicago.

[2] This plan, carried to its logical conclusion in the German universities, has as a whole few advocates in the United States to-day. The same influences which have led to a reaction against the system of unrestricted election in our colleges reappear with even greater force in the sphere of professional education. Cf. Carnegie *Bulletin No. 4*, "Medical Education," p. 76.

[1] This is the plan followed at Yale, where the courses offered are grouped under the following five heads: (1) the department of pastoral service; (2) the department of missions; (3) the department of religious education; (4) the department of practical philanthropy; (5) the department of the philosophy and history of religion.

[2] This plan is followed at Union Theological Seminary in New York City, where all graduates in order to receive a diploma must satisfy the faculty (either by taking certain courses, by passing certain examinations, or by furnishing other satisfactory evidence of knowledge and efficiency) of adequate attainments in the following subjects: Old Testament, New Testament, church history, systematic theology, and some branch of practical theology.

[3] On this point there is wide difference in practice of leading seminaries. Some still require Hebrew as well as Greek for graduation. Others, including not a few of high standing, *e.g.* the Harvard Divinity School, do not require either. Still others, *e.g.* Union, distinguish between the diploma and the degree, requiring the languages for the latter, but not for the former.

Social and economic questions hold the center of interest. The growth of great cities, with their polyglot and rapidly shifting population, has broken down the older parish system. The stronger churches have become great institutions, undertaking varied activities and commanding the service of a number of trained workers, while the country districts, on the other hand, are impoverished. Many once flourishing churches are threatened with extinction. Under the circumstances, the older methods of training are no longer adequate. The demand so frequently made upon our colleges that they shall train men for life is repeated with greater insistence in the case of the seminaries. It is not enough, we are told, to add new subjects to the curriculum; the whole point of view must be changed. Theological instruction must be made more practical; it must fit men more directly to do efficiently the work to which they will be called.

In various ways the seminaries are trying to adapt their methods to the new situation. For one thing, more emphasis is being laid upon practical work during the seminary course. Where the older seminaries discouraged their students from doing outside work, often forbidding them to preach during the earlier years of the course, the tendency to-day is in the other direction. Students are encouraged to engage in practical work in churches and Sunday schools; to preach on Sunday, and even to undertake the care of parishes. So far has this tendency gone that in many cases it makes serious drains upon the time and energy which should be given to the work of the classroom, and the effort to control the situation by faculty supervision, or by the appointment of special student advisers, has been only moderately successful. Theoretically, the practical work of the student is regarded as a part of his seminary training, corresponding to the work done by the medical student in the clinic. In practice, however, it too often proves only a convenient way of adding to the student's income. The choice of a field of work is, for many students, necessarily determined by financial considerations, and the church which can afford to pay is not always the church which has most to teach.

A further attempt to meet the situation is through the differentiation of classes of students according to their proposed life work. It is clear that the needs of a man who expects to be a teacher are different from those of the preacher; and his, in turn, from those of the man who is looking forward to a Y.M.C.A. secretaryship or to settlement work. It makes a difference, too, whether a man expects to serve in this country or on the foreign field; or, again, whether he looks forward to a city or a country parish. In practice, however, it proves difficult to draw a sharp line of distinction between the different groups of students. There is a body of common knowledge which all alike need. Beyond this, individual cases vary so widely that no curriculum can make equal provision for them all.

At three points only has differentiation of seminary training gone so far as to require special notice. The first is the development of advanced courses for those who desire to fit themselves to be teachers or otherwise to specialize in the several branches of theology. From the beginning, as we have seen, this aim has always been present in the minds of those responsible for theological education. Side by side with those who enter the seminary with a view to preparing themselves for the work of the ordinary ministry there has been a group of men who have made theology as a science their life work. With the growth of the elective system the opportunities open to men of this class in the modern seminary have greatly increased. Through the introduction of seminars and other classes for special research, opportunities have been opened to them not offered to the rest of the student body. And in the case of some institutions special graduate departments have been organized with a course of study extending from one to three years, leading in some cases to the degree of Master, and in others to that of Doctor of Divinity.

The second instance of differentiation is the provision of special courses within the seminary itself or in departments affiliated with it and under its control, for the training of men for special forms of service. Beginnings have been made here along three lines: (1) religious education; (2) missions; (3) philanthropy. And it is likely that we shall see further differentiation in the near future. In this connection mention should also be made of the provision of special courses, and in some cases of special departments for the training of a foreign-speaking ministry in its own language.

A third point which requires special notice is the provision of elementary courses of a university extension character for those who are not in a position to take the full seminary course. This is done in various ways: Either (1) through the holding of brief conferences of a few days' duration for a group of selected ministers; (2) through summer schools with a regularly organized staff of instruction and curriculum; or (3) through the offering of shorter courses of a more elementary character by the staff of the seminary itself for those who are not looking forward to the work of the regular ministry.

One effect of this increased demand upon the seminary has been to make it difficult for the smaller institutions to meet the competition of the larger seminaries. We have already referred to the tendency among the nonconformist colleges of England to find their way to the great cities to seek university affiliation. The same tendency is noticeable in this country. The removal of Andover to Cambridge is a case in point; and the recent removal of the Union Theological Seminary to the immediate vicinity of Columbia University is another example. The advantages of such close affiliation with a university, from the point of view of economy of teaching, are so obvious as to need no comment; while the presence of a seminary in the heart of a great city provides unrivaled facilities for the practical training of which we have been speaking.

A second effect has been to make apparent the necessity for the lengthening of the seminary course. At present this ordinarily occupies three years. But with the increasing demands upon the curriculum this is altogether inadequate, especially when, as is now the case in many institutions, the better part of one year is given to purely linguistic study. Hence the demand for a four-years' course in those institutions which stand for advanced theological training. The practical difficulty in the way of this proposal is that it will postpone the student's entrance upon the practice of his profession until too late. Where a college degree is insisted upon as a condition of entrance to the seminary, such an extension would mean that most men would not graduate from the seminary until they were twenty-five or twenty-six years of age. An alternative proposal which has much to recommend it is that the professional preparation should begin in the college course itself, the last year of which should be devoted largely to professional study, as is now the case in many institutions with students of law and medicine.

A question which is debated by theological teachers is that of the financial support of the student during his seminary course. In most seminaries in this country, as in England, tuition is free, and ample scholarship funds are available for candidates for the ministry. Opponents of the present system argue that it puts the minister at a disadvantage in comparison with the members of other professions, and that the requirement of a tuition fee corresponding to that asked in other professional schools would make for the self-respect of the profession. Advocates of the existing system reply that conditions are not parallel, as the minister cannot hope for the financial rewards open to those who enter upon other professions; that the necessity of work for self-support during the seminary course will accentuate the tendency to a harmful division of interest, already apparent, and that the true solution of the problem is not the removal of financial aid, but the extension of the system of free tuition to other professions, as is already the case in the state universities of the West.

The Problem of Ecclesiastical Control. — One more problem requires brief mention: that of the relation of the seminaries to the authorities of the churches they are designed to serve. The question of the control of theological education has always been a burning one, and in every age the advocates of strict control and those who believe in the largest liberty have contended for their respective theories. The best known example of the latter method is the German universities. Most of the denominational seminaries of this country and of England represent the former. The method in which the control is actually exercised varies widely. In some cases it is exercised by the ecclesiastical body itself; in other cases, by a board of trustees appointed by and responsible to it. Sometimes the tie is moral rather than legal, as in the case of the Union Theological Seminary during the first decades of its history. But in general, the belief that the seminary should serve the church of which it is a representative and should conform to its standards has been the prevailing one. The idea of theological education in Protestantism has been, on the whole, denominational. In recent years, many causes have combined to render this conception unsatisfactory. The pressure of the common need, revealing new problems not contemplated by the older systems; the unifying influence of the scientific principle so potent hitherto in other branches of education; the example of the mission field, where denominational coöperation in theological instruction is a practical necessity; better acquaintance with the teachers of different institutions, brought about through their association in voluntary groups of interdenominational character; above all, the growing desire for church unity with its emphasis upon the things which all Christians hold in common; — all combine to emphasize the wastefulness of the present denominational system, and to raise the question as to the true relation of the seminaries to the churches which they serve.

There is as yet no unanimity of opinion as to the true solution. On the one hand are the advocates of the German plan of absolute freedom. They would make theology a university discipline like law and medicine, substituting academic for ecclesiastical control. On the other are the advocates of the present system, still in the large majority, who claim that the desired end can be reached without any modification in the existing machinery, through the infusion of a new spirit into the character and ideals of the instruction given. And it cannot be denied that much has already been done along these lines. A third possibility is suggested by the example of Union Theological Seminary, where an institution originally denominational in sympathies, if not in control, and still retaining its independence as an autonomous institution, has become interdenominational in character by the abolition of denominational subscription and the inclusion in faculty and board of representatives of different communions.

A question which is sure to receive increasing attention in the future is the extent to which the university as such can rightly be held responsible for the training of religious leaders. The tendency in this country to a strict divorce of church and state, and the assumption by the denominations of full responsibility for the training of the ministry has led in many cases, notably in that of the state universities, to an almost total neglect of religion as a subject of university study. There are signs, however, of reaction from this untenable position, and the leading universities are beginning to make provision for undergraduate courses in the study of religion, and in some cases are coördinating their offerings in a single department.[1]

Whatever the method or methods which shall finally be adopted, there can be no doubt that there is need of greater coöperation among those responsible for theological education than has been the case in the past. Nothing militates more against the respect which men have for the study of theology than the lack of agreement among its official representatives as to the principles which ought to obtain in the training of students for the ministry. The time has surely come when, on the part of at least the leading institutions of the chief denominations, some agreement can be reached as to the fundamental requisites of an adequate and effective theological education. Such an agreement, even if only voluntary in nature, would exercise a powerful moral influence upon the whole field of theological education and would tend to elevate the standing of the ministry as a profession.

Be the course of the future development what it may, no one who has at heart the welfare of his kind can fail to recognize the vital importance of the questions which have been raised. In spite of complaints of the failing influence of the ministry, no substitute has yet been found to take its place, nor is there any likelihood that such a substitute will be found in the future. The only question is whether its work shall be done efficiently or inefficiently. When one contemplates the place held by the church in the spiritual life of the past, the lofty ideals for which she has stood and still stands, and the resources of power which she has commanded and still commands, one must earnestly hope that some way will be found so to relate her teachings and aspirations to the highest culture of the time as to make it possible for it still to retain her ancient position of spiritual leadership. Whether this will be the case or not, will depend in no small measure upon the future development of theological education. W. A. B.

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THEOPHRASTUS OF ERESUS IN LESBOS (372(?)–287 B.C.). — a friend of Aristotle and his assistant in the conduct of the Lyceum. After his master's death, in 322 B.C., and, it is said, in accordance with the expressed wish of the latter, he succeeded to the management of the school and directed it with great success for thirty-five years. As a teacher and writer he contributed much to develop and extend the influence of the Peripatetic School. His original name was Tyrtanus, the surname Theophrastus having been given to him on account of the brilliancy of his discourse. In common with most of his associates he was inclined more to scientific activity than to metaphysical speculation. In the interpretation of the Aristotelian philosophy and psychology he emphasized the doctrine of immanence somewhat pantheistically, yet he affirmed that reason in man is an original endowment, implanted in a perfect state, and not a development from within. In his ethics, which he presented in several treatises and illustrated in detail by the analysis of typical characters, revealing much insight into human nature, he was disposed to lay emphasis upon material goods and social advantages as necessary conditions for the cultivation of virtue. On this account later critics charged, but unjustly, that he believed "fortune, not wisdom, rules life." In collaboration with Eudemus he made various alterations in the Aristotelian logic and extended it in certain directions. The treatment of the syllogism, for example, was enriched by the theory of hypothetical conclusions which included also a discussion of disjunctive propositions. Under his leadership the school made investigations in the scientific-historical field, and his own chief merit as a scholar consists in the contributions which he made to natural science, especially to the science of botany, and in the investigations which he made in the history of the sciences.

Of his many writings all that remain are two botanical works, *περὶ φυτῶν ἱστορίας* and *περὶ φυτῶν αἰτιῶν*, certain fragments of his metaphysics and of the history of physics, and the *ἠθικοὶ χαρακτῆρες*, containing selections from his ethical works. S. W.

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THEORIES OF EDUCATION. — See Course of Study, Theory of; Education; Pedagogy; Philosophy of Education; Principles of Education; also Humanism and Education; Realism and Education, and similar topics.

THEORY AND PRACTICE. — The term theory is used to denote any intellectual principle; that is, any conception which is employed to explain and organize a body of facts. Its sense varies from the subjective to the objective; that is, from the notion of an unproved idea to a law. So far as its usage is distinguished from that of the term hypothesis (*q.v.*), theory is reserved to designate the more ultimate and inclusive principles of explanation, as the Newtonian theory of gravitation, the Darwinian theory of evolution. The educational importance of the conception, so far as it does not fall within the function of hypothesis in thinking, centers about the problem of the relation of theory and practice.

As noted elsewhere (see Liberal Education), Aristotle distinguished between theoretical and practical knowledge, to the advantage of the former. It alone is universal, demonstrative, and complete or self-inclosed, which is as much as to say that it alone is knowledge in the full sense of the term. Practical knowledge is a *pis aller* in default of the possibility of something better, having to do with what is contingent and particular, varying with accidental circumstances. This conception affected the whole concept of liberal education, and furnished the intellectual basis for the descrediting of vocational and professional training. Its modern counterpart is the identification of the practical with utility, meaning by utility something which serves personal advantage or at most an external and mechanical type of social need. The separation of theory and practice clearly affects the meaning of both. Theory is not only isolated from application to life, but practice is separated from the intellectual and all that that term connotes. Since it is impossible to rate very highly that which is taken to be antithetical to intelligence, the "practical" thus reduces itself to what is connected with making money or securing the material commodities of existence. With such a background, the only ground that could be urged for "practical" studies was the bare fact that, being practical, they were indispensable, together with a disparagement of theory as futile, idle, and unverifiable.

The change in educational philosophy which is occurring at present is due to causes which render doubtful the basic idea of the divorce of theory and practice, — causes which give theory, properly understood, a practical value and practice an intellectual function and content. These causes are, first, the growth of a practice, or art of knowing, involving the use of experimentation; secondly, the development of industry on the basis of science; and, thirdly, the evolutionary conception of intelligence as an agency of purposive adaptation of the environment to the expansion of life. Under the conditions in which Aristotle wrote and the older cultural tradition obtained, knowledge was a matter of personal excellence, depending upon an insight which was native, a divine gift. There was, in pure science, no art of knowing having its specific equipment and technique. With the incoming of modern methods of natural science, the situation has radically changed. While, of course, superior natural endowments will always count, knowledge has ceased to depend exclusively upon intellectual genius. In fact, the working of natural gifts severed from the common possession of appliances and technique is looked upon with suspicion, as an attempt to evolve knowledge out of inner consciousness. Knowing in its best form, science, has become an organized art pursued by those professionally trained to carry it on. When knowing has itself become a form of practice, it appears absurd to try to keep sharp lines of demarcation between theory and practice, since its effect would be to identify theory with those intellectual exercises that by their nature fall short of knowledge. The line is further obliterated because the practice of the art of knowing in the natural sciences involves the actual manipulation of physical materials and appliances in experimentation in order to bring about changes in natural phenomena. Progress in knowledge began systematically when those occupied with inquiry borrowed the tools and methods of those engaged in the practical arts. Even Greek mechanics remained a branch of geometry, not available for the investigation and explanation of natural events, because of the Greek contempt for manual work and machinery. The new science of nature arose when the conceptions of energy, space, time, motion, and matter of necessity employed in the industrial arts were taken over into the theory of physics and chemistry.

The influence of the industrial revolution is the obverse of the change just mentioned. When theoretical science borrowed freely from the practical arts, its results were naturally available for the promotion of the latter. When practice was a routine matter, a blind following of traditions worked out by rule of thumb, it was natural to place it in antithesis to reason. But when invention of machinery for the effective utilization of natural forces followed in the footsteps of scientific discovery (when, indeed, the need for some invention became a chief motive in setting scientific problems and stimulating scientific inquiry), it was henceforth impossible to maintain the idea of practice as something resting on custom, to the exclusion of thought. The third cause, the influence of evolutionary biology, has hardly been felt outside of philosophic circles, while the first two causes have more or less consciously affected every one's thinking; but it implies a profound change in the whole conception of the nature of thought and reason. According to it, the organs of mind — the sense structures and the brain — have been evolved in the process of the development of living organisms as part of the evolution of life itself in complexity and scope. Thought cannot, therefore, be put in opposition to action but appears as the chief instrumentality in the emancipation and enrichment of action. The antithesis is no longer between theory and practice but between idle and unverifiable thinking and thinking to a purpose, between blind and enlightened practice. J. D.

See ACTIVITY; CULTURE; EXPERIENCE; PRAGMATISM.

THICKNESSE, GEORGE (1714–1790). — English schoolmaster, born at Farthingoe, Northamptonshire. He was educated at Winchester and possibly at Cambridge. In 1737 he became chaplain and third master at St. Paul's School, London, and from 1748 to 1769 was High Master. The school at the time of his appointment was on a rapid decline and only had an enrollment of thirty-five boys. In a very short time he raised the numbers of foundationers and nonfoundationers, and the school again entered upon a career of success, many of the pupils under Thicknesse attaining to positions of eminence in their country. On his retirement in 1769 he was requested by the governors to name his successor and was given a pension of £100 a year. The remaining years of his life he spent with an old schoolfellow. Thicknesse has been called, by McDonnell, the "Second Founder" of St. Paul's School.

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McDONNELL, M. F. J. *A History of St. Paul's School.* (London, 1909.)

THINKING. — See THOUGHT.

THOMASIUS, CHRISTIAN (1655–1728). — A German writer and jurist, born at Leipzig, where his father, Jacob Thomasius, one of the best-known German scholars of his time, was professor of eloquence at the university and rector of the "Thomasschule." There, where the great philosopher Leibnitz was a pupil, Thomasius also received his first education and showed such brilliancy as a student that, at the age of seventeen, the university conferred upon him the master's degree. He was greatly impressed by the natural system of law which he found in the works of Grotius and Pufendorf, and to continue his law studies he went to the university of Frankfort-on-Oder. In 1684 he commenced to lecture at the university of Leipzig and at once attracted attention not only by preferring natural law to the traditional Roman law, but by boldly attacking the dry scholasticism and pedantry of the university methods of his time. In 1687 he announced a course of lectures to be given in German, instead of in Latin, a daring innovation, since up to that time the native tongue had never been used as the medium of instruction in any German university. In fact, when Thomasius used his mother tongue in a philosophical work, for the publication of which it was necessary to obtain the permission of the university authorities, it was rejected by the censor on the ground that it was impossible to pass a book in which philosophical matters were treated in German. In the following year Thomasius published a literary magazine, in which he poured out his satire against religious intolerance, academic stupidity, and antiquated prejudices of all sorts. This was the first German publication of its kind, and Thomasius thus became the founder of German journalism. The hostility created by his lectures and writings was so great that, in 1690, he was forced to leave Leipzig. The progressive elector Frederick III of Brandenburg appointed him to teach at the "Ritterakademie" in Halle, where his lectures soon attracted a large number of students. This led to the foundation of the University of Halle (1694), in which Thomasius and A. H. Francke (*q.v.*) became the most influential professors. Through them the new university soon became a far-reaching center of the modern scientific spirit of freedom of thought and of religious toleration. Thomasius taught at the university until his death. Among his works are *Einleitung zur Vernunftlehre* (1691), the book referred to above, *Historie der Weisheit und Thorheit* (3 vols., 1693), and *Kurze Lehrsätze von dem Laster der Zauberei mit dem Hexenprozess* (1701), in which he attacked the trial of witches and the use of torture in criminal proceedings. F. M.

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Schrader, Wilhelm. *History of the University of Halle*, Vol. I. (Berlin, 1894.)

THOMPSON, SIR BENJAMIN, COUNT RUMFORD (1753–1814). — Scientist and administrator, born at North Woburn, Mass. He was educated in his native town, at Byfield and Medford. At an early age he was apprenticed in a goods store at Salem, but showed more interest in mechanical contrivances and the study of algebra, geometry, astronomy, and drawing. In 1769 he took employment in Boston and attended lectures at Harvard in surgery and medicine. On the outbreak of the War of Independence he took a commission in the English army and on the evacuation of Boston he was sent to England with dispatches. Here he received an appointment in the Colonial Office, but found time to continue his studies on gunpowder and the velocity of projectiles. After a second period of service in America, he returned to England but in 1783 took service with the Elector of Bavaria and at the same time was knighted by King George III. He remained here for eleven years and introduced many reforms in the army and in the treatment of the poor and of beggars in Munich. He was created Count Rumford for his services. On his return to England, he turned his attention to inventions for promoting comfort at the fireside and made suggestions on cookery, clothing, and fuel economy, and the remedy for smoking chimneys. His chief scientific contribution was contained in a paper read before the Royal Society in 1798, *Enquiry Concerning Source of Heat which is Excited by Friction*, proving that heat is a form of motion. Rumford presented money to the Royal Society and the American Academy of Arts and Sciences, for gold and silver medals to be given biennially for the most useful contributions on light and heat. In 1799 he assisted in founding the Royal Institution of Great Britain (*q.v.*) and was its first secretary. The last five years of his life he spent at Auteuil, near Paris. By his will he established a professorship of physics at Harvard University, and left £1000 and his philosophical apparatus to the Royal Institution. Rumford's collected works were published as *Essays political, economical, and philosophical* (London, 1796-1802; Boston, 1798–1804), and in 1870 the American Academy of Arts and Sciences began the issue of an edition of his writings, completed in four volumes, with a fifth volume containing a memoir.

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Tyndall, J. *New Fragments*, pp. 94–173. (New York, 1896.)

THOMPSON, CHARLES OLIVER (1836–1885). — First president of the Worcester Polytechnic Institute; was educated at Dartmouth College. He was teacher in the district schools of Connecticut; principal of secondary schools in Vermont and Massachusetts; president of the Worcester Polytechnic Institute (1868–1883) and of the Rose Polytechnic Institute (1883-1885). His publications include *Hints towards a Profession of Teaching* (1867), *Industrial Drawing* (1871), *Manual Training in the Public Schools* (1884), *Modern Polytechnic Schools* (1884), *Technical Instruction* (1885), and, jointly with Andrew D. White, *Manual Labor and School Work* (1870). Mr. Thompson was one of the leaders of the movement for the introduction of manual training in the schools of the United States. W. S. M.

See Manual Training.

THOUGHT. — Thought is loosely employed in common parlance as a generic term to include such diverse states as perception, memory, imagination, feeling, emotion, and acts of reasoning or acts of will. By psychologists and logicians, the term is generally given a narrower implication, which confines its application to cases of rational inference, to reasoning in one or other of its forms. This distinction in usage is not so radical as might appear, owing to the fact that psychological analysis exhibits the unappreciated extent to which rational thinking depends upon and involves the other properties of mind.

Biologically considered, thought is the most highly evolved device for aiding organisms in their adjustment to environment. It therefore gets its final explanation in the modifications of behavior which it occasions. Organisms possessing it are enabled to adapt themselves to the vicissitudes of life with a promptness and efficiency otherwise impossible. Despite this fact, the mental operations of the animals have been shown by modern scientific study to differ in some important respects from the reflective processes in man.

It is very doubtful to what extent, if at all, the higher animals make use of ideas such as human beings employ to guide their conduct. Moreover, it is essentially certain that the lower animals have no such ideas. Nevertheless, they learn slowly to improve their reactions in any given situation, employing what has come to be known as the "trial and error method" — a method which implies the preservation, more or less completely, of a tendency to repeat accidentally successful actions, but which does not imply any power to plan in advance a method of meeting a difficulty to be overcome. This capacity, however, far as it falls short of the human achievement, marks an enormous advance over merely reflex and invariable reactions. It should be added, too, that this method of learning is closely akin to the common human methods of acquiring acts of skill, *e.g.* golf, tennis, typewriting. In these cases, there is often little or no reasoning in the ordinary sense, but simply a "try, try again" process in which patience and luck, together with a low order of selective intelligence, determine the outcome.

All thinking in the proper sense of the term grows out of situations felt by the individual to be problematic, situations with which he feels himself incompetent to cope in any merely habitual manner. The first necessity he is under is that of identifying the exact nature of the difficulty which he has to meet. The next step involves the attempt to hit upon means of solving it. The one step involves what James calls "conceiving" the problem in one way after another. This requires natural "sagacity." The second involves bringing to bear upon the problem such information as one may have at disposal and puts a premium upon an accurate, sensitive, and inclusive memory.

Suppose it becomes necessary to determine the area of an irregularly shaped plot of ground. No progress can be made until one has conceived the piece as made up of certain triangles, parallelograms, etc. Then it becomes necessary to draw upon one's knowledge of the method for determining the area of such figures. A defect in either part of the process will defeat the success of the reasoning, and the most effective reasoner is he who can most speedily hit upon the useful conception and then bring to bear most promptly the necessary information.

In the process, recourse must be had to imagination, for *conceiving* the problem in a given way is substantially equivalent to *imagining* it in the proposed form. Then memory is laid under contribution. In both these activities imagery — or some substitute for it — is employed. Moreover, in many types of problems our feelings and emotions enter in to affect the result. In problems of a social or personal character, this is peculiarly true. Under such conditions the reasoning may be good or it may be bad; the significant fact is simply that the way in which matters present themselves to us depends very largely on our emotional attitudes. Reasoning is probably but rarely "pure" in the sense that feeling plays no part in the conclusions reached.

Logicians have laid great stress upon the distinction between inductive and deductive thinking, and they have generally held that deductive thinking involved the application to a problem of a general principle already formulated and accepted, while inductive thought was concerned with the process of forming such generalizations. The actual steps of the thinking process in both instances comply, however, with the characteristics already pointed out. The differences relate to the purpose of the thought rather than to the steps by which it moves toward its completion. (For further comment see Induction and Deduction.) It may be remarked in this connection that thought processes vary enormously as regards the abstractness of the ideas with which they deal. Most thinking is concerned with rather concrete ideas relating to concrete practical problems. The mathematician and the philosopher, on the other hand, may be concerned with thoughts almost wholly abstract.

Training to think is often lauded as the main end of education. Certainly the power to reason ought to be a result of a well-considered education, but as our scientific knowledge of the mind grows, it became increasingly evident that skill in one line of reasoning is by no means to be identified with universal proficiency in thinking. In the first place, persons vary widely in the "sagacity" which they are natively able to bring to bear on a given subject matter. The man with a natural bent for linguistic research may have little or no innate capacity for mathematical or chemical investigation. Moreover, the call on memory which is one of the conditions of effective reasoning, reveals wide variations among individuals as regards their effectiveness as thinkers. Not only is prolonged training in special directions necessary for high efficiency, but men vary remarkably in the kinds of facts which they can remember well. A good memory for one class of materials, *e.g.* chemical formulæ, need not carry with it any special aptitude for remembering music.

The principal considerations to be borne in mind when the relation of education to reasoning is at stake are the following: the securing of habits of concentrated and prolonged attention; the familiarizing of the mind by actual practical contact with the important forms of procedure in reaching conclusions in each of the great typical subdivisions of human thought; *e.g.* the languages, the sciences, mathematics, history, economics, philosophy; the storing of the mind with as much well-organized material in these several directions as the exigencies of each case may permit; the cultivation of an attitude of intellectual independence by affording abundant opportunity for the use of the individual's own powers of thought. J. R. A.

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THRIFT. — See School Savings Banks.

THRING, EDWARD (1821–1887). — English schoolmaster born at Afford, Somerset. He was educated at the local grammar school at Ilminster and at Eton, where he was captain of *Montem* in 1841, one of the last occasions on which it was observed. He proceeded to King's College, Cambridge, and received his degree and a fellowship in 1844. Through his efforts an old custom by which scholars of King's were exempted from the degree examinations was abolished. In 1846 he became curate of St. James' parish at Gloucester and taught daily in the National schools there, an experience which he always regarded as extremely valuable and out of which grew his *Child's Grammar* (1852). After a period of private tutoring and travel he was appointed headmaster of Uppingham, an old country school founded in 1584 by Archdeacon Johnson of Leicester. Here he found two masters and twenty-five boys. He entered upon his new work with well-thought-out plans for raising Uppingham to one of the leading public schools of the country, free from what he called the existing "shams" of many of the schools. Finding little sympathy among the governors, he was fortunate in the selection of his assistants who stood by him loyally. Boarding houses were built, each to accommodate thirty boys, for Thring considered it one of the essentials of a school that the headmaster should be able to know each boy individually. He insisted on individual attention to bright and dull alike, for "every boy can do something well." The numbers in the whole school were restricted to 320. In the boarding houses each boy was provided with a cubicle in the dormitories and with a small private study. A gymnasium, the first in any public school in England, was erected in 1859 and a gymnastic master appointed. The curriculum was divided into compulsory and optional subjects; the former included the classics, English composition and mathematics, taught in the morning; in the afternoon the pupils could select from French, German, physical science, carpentry and metal work, music, and fine arts. To music Thring attached great value, and Uppingham was one of the first schools where it was cultivated on a large scale. Besides the system of *præpostors* (*q.v.*) Thring relied for general discipline on the social responsibility of each class, or set, and the whole school. Intensely religious and devout himself, he did much to instill such a spirit in his boys. In 1829 a mission to the poor in London and a settlement in North Woolwich were established. Thring was strongly opposed to the Schools Commission of 1865 and the Endowed Schools Act, fearing that outside interference would be inimical to the success of the school. It was partly on this ground that he suggested the formation of the Headmasters' Conference which met at Uppingham in 1869, the first body organized to represent English secondary schools. Thring was strongly sympathetic with the movement for the higher education of women and invited the Headmistresses' Conference to meet at Uppingham in 1887.

Unlike Arnold, with whom he has often been classed, Thring was identified heart and soul with his school; how much of his thoughts it occupied is sufficiently evidenced in his *Diary*. Next to the welfare of the school, the improvement of the teaching profession was dearest to him, and it is with some regret that he confessed to Fitch (*q.v.*) that his educational writings bore more fruit abroad than in his own country. His writings on education include *Education and School* (1864), *Theory and Practice of Teaching* (1883), and a posthumous volume of *Addresses* delivered before teachers' associations. His *Thoughts on Life Science* (1869), written under the pseudonym of Benjamin Place, deal with the relation of Christian faith to knowledge and human progress. Thring also wrote a series of English grammars, a subject on which he laid much emphasis: the *Child's Grammar*, already mentioned, the *Principles of Grammar* (1868), and *Exercises in Grammatical Analysis* (1868), all employing the analytical method.

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THROAT DISEASES OR HYGIENE OF THE THROAT. — See DIPHTHERIA; NOSE, HYGIENE OF THE; TONSILS.

THROOP COLLEGE OF TECHNOLOGY, PASADENA, CAL. — Founded in 1891 by Amos G. Throop as the first school of manual arts west of Chicago. It continued as an excellent polytechnic school of predominantly secondary grade until 1910, when financial growth enabled the trustees to abandon secondary work and devote all their resources to higher education of a practical character. The old buildings and equipment having been transferred to the city of Pasadena for use as a polytechnic academy, Throop now employs its new plant and entire endowment to maintain the institute of technology. Admitting only high school graduates of approved standing, it gives the degree B.S. (electrical, mechanical, and civil engineering) after a course of four years. Its curriculum includes unusually ample provision for cultural studies, so that the school may be broadly defined as a college of applied sciences plus the essential humanities. The elevation of its standards reduced the student enrollment from 400 to 40, with a teaching staff of 14. J. A. B. S.

See TECHNICAL EDUCATION.

THYROID GLAND. — See CRETINISM.

TIC. — A hyperkinetic phenomenon, consisting of a convulsive movement of small groups of muscles and occurring more or less regularly only during waking periods. The condition usually has its origin in a peripheral irritation, which is responded to by a movement, of the nature of a defense reaction. The tic is the persistence of the movement without the stimulation which gave rise to it. It may be cured by suggestion or by education. S. I. F.

See CONVULSION.

TICKNOR, ELISHA (1757–1821). — Organizer of the primary schools of Boston; graduated at Dartmouth College in 1783. He taught in charity schools (*q.v.*) and was master of grammar schools in Boston. In 1805 he began to agitate for primary schools in Boston. The grammar schools were closed to children under seven years of age and to all children who could not read. He proposed a new grade of schools for " the children of poor and ignorant parents who cannot or will not avail themselves of the private dame schools " (*q.v.*). Primary schools became a feature of the educational system of Boston in 1818. W. S. M.

TILLEMONT. — See PORT ROYALISTS.

TILLICH, JOHANNES ERNST GOTTHILF ALBRECHT (1780–1807). — German educator, born at Gross Breesen, then in Saxony. After studying theology and pedagogy at the University of Leipzig he taught privately for a time with such success that he was soon able to open a school, which was highly commended. In 1805, after visiting Pestalozzi and Salzmann, he opened a school at Dessau with Ferdinand Olivier, the author of a new method of teaching teaching and former teacher at the Philanthropinum. The school met with so much success that it became a center for the study of Pestalozzian method and was visited by many teachers and students. Tillich wrote many books on the elementary school curriculum which exercised a great influence on German schools. His best known work is the *Lehrbuch der Arithmetik* (1806), in which he advocates the use of objective methods in the teaching of arithmetic. To this end he invented what are known as " Tillich's Bricks," a series of cubes and prisms graduated in size, simple, easily handled, and easily combined so that the numerical and size relationships can be seen at a glance.

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TILLINGHAST, NICHOLAS (1804–1856). — First principal of the Bridgewater (Mass.) State Normal School; was educated at Bristol Academy and the United States Military Academy, graduating at the latter institution in 1824. He was instructor at the United States Military Academy (1827–1834); principal of schools in Boston (1836–1839); instructor in the Westfield Normal School

(1839–1840), and principal of the Bridgewater Normal School (1840–1853). His publications include *Prayers for Schools* (1852) and *Elements of Plane Geometry* (1844).

W. S. M.

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Boyden, A. G. *History and Alumni Record of the Bridgewater Normal School.* (Boston, 1876.)

TIMBRE. — Timbre is popularly spoken of as the quality of tones, but the term quality, from the psychological point of view, has reference to pitch and can be applied to timbre only in so far as timbre may be considered a compound of tones of different pitch. Differences in timbre are due to the presence and relative prominence of overtones. When a violin string vibrates as a whole, it also vibrates in segments, — halves, thirds, and these in halves and thirds, and so on. Each of these partial vibrations really produces a tone, but these tones, called *overtones*, stand in simple mathematical ratios, and therefore blend and fuse with the fundamental tone. What we hear as a simple tone is really a *clang*, hence we speak of *clang tint* or *tone color*, both terms having reference to timbre or the distribution of overtones. The difference in tones from different instruments is one of timbre. The violin string and the human voice produce rich " round " tones because many overtones present must be well balanced. The French horn brings out the low overtones, while the flute brings out the high. A tuning fork produces a relatively *pure tone;* a tracing of its vibrations approaches closely to a uniform series of sine curves. The only difference in *vowels* is a difference in timbre. All the vowels may be spoken in the same pitch, but whether it shall be A, E, or I, etc. depends upon what set of overtones dominates. C. E. S.

TIME. — See Musical Notation.

TIME ALLOTMENT. — See School Management.

TIME PERCEPTION. — The stream of consciousness (*q.v.*) consists of a series or succession of experiences. This series of experiences gives rise under certain conditions to the idea of sequence and duration. Certain psychologists have regarded the consciousness of duration as one of the fundamental properties of the simplest elements of experience. They find even in sensations (*q.v.*) the characteristic of duration. (See James, *Principles of Psychology*.) Other psychologists regard duration as the outcome of a grouping of experiences. For this latter type of thinkers the discussion of time perception follows much the same lines as the discussion of space.

The problems of time perception are somewhat more obscure than those of space, in view of the difficulty of making any experiments that are dependent upon external stimulations. Time is a universal characteristic of mental processes. Some experiments have, however, been made which show the relation between the perception of duration and the preparation of the observer for the reception of stimulations. Thus, if a monotonous series of sounds is suddenly interrupted by a relatively very faint sound, the expectation which has been established by the early part of the series will not be satisfied by this faint sound. The result will be that there will be a lingering of expectation and the interval which was terminated by the weak sound will seem long. Conversely, the interval which follows the faint sound will be shortened. A common experience which is somewhat similar in type is that in which one becomes aware of duration when he is waiting for something to happen. Under such circumstances time seems to move very slowly, whereas when the succession of events is very rapid and interesting the duration is not recognized as an important phase of experience. There is an intimate connection between duration and emphasis, as exhibited in versification. The accentuation of a syllable has a marked effect upon the temporal value of this syllable in making up a foot of the verse. One of the most notable distinctions between Greek and Latin verse on the one hand and English verse on the other is to be found in the fact that the former depended very much more on the quantity or temporal characteristics of the syllable, while English verse depends very much more on stress or accentuation which in turn influences the apparent duration. In both cases the rhythm is determined in a very large measure by the perception of duration.

The ability to perceive temporal characteristics of experience matures with the individual. Young children have very little notion of time. Their experiences are not sufficiently coherent for them to recognize sequence with any precision. Even the use of past and future tenses of verbs is a relatively late phase of language development. In music and in the reading of verse there is an opportunity for training in the recognition of intervals. The natural pleasurable experience which arises from any form of rhythmical movement may also be utilized to contribute to a more precise recognition of short intervals of time. The longer intervals of time can be recognized accurately only through an exercise of the imagination. In this respect time differs from space sense. It is possible in a single act of perception to include a great distance or a large surface, whereas in the perception of duration it is inherently impossible for an individual to include in a single act of immediate perceptual consciousness more than a short interval of time. There can, therefore, be no training of time perception that is analogous to the training which can be given to space perception in drawing or in pacing off distances. On the other hand, the development of an idea of time and of intervals can be cultivated through a study of history. The formal learning of dates and the placing of historical events in proper sequence leads to an accurate temporal idea in much the same way as training in the interpretation of maps leads to a mental interpretation of a visual symbol. C. H. J.

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TIME-TABLE OR SCHEDULE, DAILY, OF THE SCHOOLROOM. — See School Management.

TIMIDITY. — See Adolescence; Emotion; Modesty.

TOBACCO. — See Temperance Instruction; Narcotics.

TOBLER, JOHN GEORGE (1769–1843). — Swiss educator and disciple of Pestalozzi, born at Trogen. After an inadequate preparation he entered the University of Basel, intending to study for the ministry. Discovering that he was unfitted for this profession, he decided to teach, and opened a girls' school at Basel in 1799. In 1800 he was invited by Pestalozzi to Burgdorf, and worked by his side, in spite of much disagreement, there and at Münchenbuchsee and Yverdon. On leaving Pestalozzi (about 1807), he opened a labor school at Mühlhausen which was soon attended by about five hundred pupils. After 1811 Tobler taught at Glatus, was private tutor for a time, and for ten years had charge of a school at St. Gall. He retired to Basel and died there in 1843. Tobler was an ardent disciple of Pestalozzi and applied his method to the teaching of geography, language, and nature study. He was also a strong advocate of the training of teachers and the training of mothers as teachers.

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TOKYO, IMPERIAL UNIVERSITY OF. — See Japan, Education in.

TOLSTOY AND EDUCATION. — The subject of education is one about which Tolstoy was always much concerned. When he left the university in 1847, before he was nineteen, he made a spasmodic effort to found a school for his serfs; but cards and women diverted him from the attempt. He subsequently spent five years (from 1851 to 1856) in the army, and after that traveled abroad before his interest in education again manifested itself.

In the winter of 1859–1860 he returned home to Yásnaya Polyána, and devoted much time to organizing village schools on his own estate and in the neighborhood. From July, 1860 to May, 1861 he again traveled abroad, visiting Germany, France, Switzerland, Italy, and England, and during that journey he devoted himself chiefly to the study of the educational systems of those countries, which he found to be artificial and unsatisfactory.

Returning again to his estates, he threw himself ardently into school work and edited an educational magazine, called *Yásnaya Polyána*, in which he described the methods he had adopted and advocated his ideal of free education. Only twelve numbers of the magazine appeared, and it has long been a bibliographical rarity, but the chief articles he contributed to it were republished in the collected Russian edition of his *Works*.

His plan was to force nothing on the children. Every boy or girl was free to come to school or to stay away, and in school they might sit where they liked and need only learn what they liked. They were free to criticize the teachers and to make any suggestions they pleased. Tolstoy contrasted the eager vivacity of children playing in the gutter with the apathy of the same children when compelled to learn lessons that do not interest them; and he maintained that only when minds are eager, animated, and excited can real and rapid progress in education be achieved.

His experiments were carried out under favorable conditions in that he, as squire and proprietor of the estate, was respected by the villagers and their children. He personally also undoubtedly possessed great pedagogic tact, and a capacity to interest and animate his pupils; and, moreover, he was helped by enthusiastic young assistants. The result was that none of the children in his schools ever failed to learn to read, write, and cipher, though many of them were only in school for a couple of winters. The teachers had the right to exclude from school pupils who interrupted the lessons; but this practically never occurred. On the contrary, the children were so keen on their work, that they often kept their teachers in school till late at night.

One of Tolstoy's greatest difficulties lay in the non-existence of suitable reading books. The Old Testament was almost the only thoroughly satisfactory reading matter he could find. He considered its stories to be the best introduction for children, not merely to literature, but to a broad conception of human society and all its problems.

In teaching composition he held that the great thing is, at first, till they have realized their creative powers, to free the children from worry about the mechanical part of the work. The rules for encouraging composition which he deduced from his own experience were these: —

"(1) To offer as large and varied a choice of themes as possible; not inventing them specially for children, but offering such as most interest the teacher himself and seem to him most important.

"(2) To give children stories to read written by children and to offer them only children's compositions as models; because these are juster, finer, and more moral than those written by adults.

"(3) (Specially important.) Never, when looking through the compositions, to make any remarks to the children about the neatness of the exercise books, the handwriting, or the spelling; nor, above all, about the construction of the sentences, or about logic.

"(4) Since the difficulty of composition lies not in size nor in subject, nor in correctness of language, but in the mechanism of the work, which consists: (*a*) in choosing one out of the large number of thoughts and images that offer themselves; (*b*) in choosing words wherewith to clothe it; (*c*) in remembering it and finding a fitting place for it; (*d*) in remembering what has already been written, so as not to repeat anything or omit anything, and in finding a way of joining up what has preceded to what succeeds; (*e*) and finally in so managing that while thinking and writing at one and the same time, the one operation shall not hamper the other." He adds: "I, having these things in view, proceeded as follows: —

"At first I took upon myself some of these sides of the work, transferring them gradually to the pupils. At first, out of the thoughts and images suggested, I chose for them those which seemed to me best, and I kept these in mind and indicated suitable places to insert them, and I looked over what had been written to avoid repetitions, and I did the writing myself, letting the children merely clothe the thoughts and images in words. Afterwards I let them select; and then let them look over what had been written, and finally they took on themselves the actual writing. . . ."

From his intercourse with them Tolstoy became profoundly convinced of the susceptibility of Russian peasant children to good works of simple art, and it was largely as a result of this experience that he arrived at some of the views which he expressed in later years in *What is Art?*

His exertions as a schoolmaster were so strenuous as actually to injure his health, and he had to go to the wilds of Samára for a nature cure. During his absence, on false information supplied by a police spy, who asserted that Tolstoy kept a secret lithographic press, gendarmes visited his estate, broke open all his drawers, turned everything upside down in the schools, frightened his sister and his aunt, and created among the peasants the impression that the government was opposed to his educational efforts.

That rebuff alone might not have sufficed to stop the work, but soon after this, on Sept. 23, 1862, he married, and his life and activities took a new turn. It was not till several years later, after the publication of *War and Peace*, that he again occupied himself seriously with educational matters. He then devoted himself to supplying the want he had so keenly experienced of a good school reading book, by compiling one himself.

He accomplished this task most admirably, and the book met with great success. More than a million copies of various editions have been sold. The longest stories it contained were *A Prisoner in the Caucasus* and *God Sees the Truth*, the first of a series of admirably simple stories for children and peasants which deserve to rank among Tolstoy's greatest achievements. They are published in *Twenty-three Tales.* In 1874 he lectured in Moscow on methods of teaching children to read, and published an article *On Popular Education.*

After his change of religious outlook in 1878–1880, and his adoption of a new view of life, Tolstoy was too completely absorbed by other work to devote much time to education, in the ordinary acceptation of that term. He did, however, write many letters on the subject, of which a characteristic specimen is included in his *Essays and Letters.*

He approved of education which teaches man his duty to God and his fellow-man, and which enables him to provide the necessaries of life for himself and for others, disapproved of all education which aims at giving to some particular members of society exceptional social or economic advantages, as well as of education gained at the expense of the laboring classes, who have to build the schools and support the teachers and scholars, with the result of enabling a favored few to live on the backs of the many.

In his later years Tolstoy resumed the practice of gathering the village children around him; and in 1908 he wrote a small book entitled *The Teaching of Jesus*, which was an outcome of his efforts to impart Christ's teaching to a class of village children of from ten to thirteen years of age.

The keynote of all his educational efforts was "freedom." The subject matter with which the pedagogue has to deal, if he would attain good results, is, he says, the "free child."

A. M.

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TOMPKINS, ARNOLD (1849–1905). — Professor of education; was educated at the Indiana Normal School, the Indiana University and the University of Chicago. He was teacher in the public schools (1870–1875); superintendent of public schools (1875–1885); instructor in state normal schools (1885–1893); professor of education in the University of Illinois (1895–1899); principal of the Illinois State Normal School (1899–1900), and principal of the Cook County Normal School (1900–1905) succeeding Colonel Francis W. Parker (*q.v.*). His publications include *Science of Discourse*, *Philosophy of Teaching*, *Philosophy of School Management*, *Literary Interpretations*, and contributions to educational journals. W. S. M.

TOMSK, UNIVERSITY OF. — See Russia, Education in.

TONALITY. — See Musical Notation.

TONE DEAFNESS. — See Deafness.

TONES. — Tones correspond to periodic vibrations, *e.g.* the vibrations of a tuning fork or a string. In simple tone sensations we are concerned with *pitch*, *timbre*, *intensity*, *duration*, and *space*. Combinations of tones give rise to *consonance* or *dissonance*, *beats*, *combination tones*, *melody*, *rhythm*, etc. C. E. S.

TONIC SOL FA. — See Music in Education.

TONKING. — See French Colonies, Education in.

TONSILS AND TONSILLITIS. — The tonsils are small masses of lymphoid tissues developed in the ring that surrounds the respiratory and digestive passages. Four of these so-called tonsils are especially important, the single tonsil at the apex of the ring in the pharyngeal vault, the two faucial and the single lingual tonsil at the base of the tongue. The development of the tonsillar ring begins in fœtal life and reaches its stage of greatest development in childhood, and the upper part of the ring tends to disappear in the second decade of life.

We know little about the tonsils and there is much difference of opinion in regard to their function. According to one view the tonsil has the function of protecting the organism from infection. It is a bulwark where enormous numbers of leucocytes are on guard against pathogenic invaders. According to the other view the tonsils are a survival of the early stages of evolution, valuable in the aquatic stage, but now like the vermiform appendix, useless and often distinctly harmful. In support of the latter view is cited the fact that the tonsils often become infected and are the means of carrying infection to other parts of the organism, and that such a disease as rheumatism, for example, is often cured by excising the tonsils. In support of the former view it is argued that if the tonsil has merely the function of absorbing poisonous substance, why should nature surround it by lymphatic glands which resist infection into the general system; and how is it that millions of bacteria, staphylococci, can be cared for by this organ when very few of them in a wound may result fatally? And again it is argued, although the tonsils may be sometimes the source of infection, why should we abolish the sentinels because sometimes overworked?

The significant facts are that the tonsils often become enlarged during childhood for some reason connected with the greater activity of the lymphoid tissue in the early years. Whether or not these should be removed by operation is a question that should be decided in each individual case on the advice of a competent specialist, but it should always be remembered that disease of the tonsils is likely to be closely related with rheumatism and endocarditis, and on the other hand that the enlargement if slight may be merely coincident to eruption of the molars, and likely to subside without operation after the coming of the teeth.

The term tonsillitis is usually employed to indicate an infection of the faucial tonsils. If an abscess is formed, it is called quinsy, if the follicles of the tonsils are especially inflamed it is called follicular tonsillitis. The symptoms of tonsillitis are enlargement and inflammation of the tonsils accompanied by fever and general prostration. This is a very common disease among school children. When a case occurs, the school nurse or medical inspector should always be consulted; and, if there are no such officers, the child should be sent home with the advice to consult a physician. In many cases it is possible only by a culture to determine whether the disease is tonsillitis or diphtheria, and even if the case proves to be tonsillitis, it demands serious treatment, because it seems to be a general infection, and serious complications, especially endocarditis, — inflammation of the membrane lining the heart chambers and valves, — are liable to result. Children suffering from the disease should be excluded from school and cases followed up by the school nurse; and it would be wise to require a physician's certificate before permitting a convalescent pupil to return to school. W. H. B.

See Teeth, Hygiene of the; Nose, Hygiene of the; Medical Inspection.

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TOPICAL METHOD. — The use of topical outlines in teaching is a method of wide applicability and high value. It is important that the general topic be within the interest and comprehension of the pupil in order that it suggest a problem vital enough to him to be an incentive for study. The assignment of lessons for preparation by the topical method is far superior to any mere mechanical assignment by pages or chapters. An important topic stated in the form of a problem, guiding the child's observations and readings, gives him an aim which becomes his standard for selecting and rejecting facts upon the basis of their pertinency, — a far more logical method of mastering a subject than that of appropriating any total series of facts observed or discussed. In his study or preparation the child should be encouraged to construct an outline representative of his own thinking, so that the pertinent facts upon which he has focused his attention may be connected in larger and larger wholes, which give a related and unified view of his problem rather than isolated and fragmentary glimpses. Then when the child's study is tested in recitation, review, or examination, he is more likely to present his knowledge in a vital and rational organization that is far different from that recall which is the product of omnivorous cramming. The logical outlines given by textbook or made by the teacher may be utilized as an ultimate test upon any given subject to determine whether or not the final organization of the child's knowledge and thought is sufficient to appreciate that logical systematizing of facts, connections, and relations towards which the teacher's guidance has been aiming. The too early imposition of an outline representative of an adult's reflective thinking may inhibit real thought and study upon the child's part. Care must be taken to make any preliminary or intermediating outlines given by the teacher fit the movement of the child's interest and thought. In this way, both the spontaneous thought of the pupil and its organization in more logical ways are assured.

Traditionally, the topical method has been most overused (and abused) in the teaching of history. Its use in geography, nature study, oral and written composition, and civics, is extensive. Probably no single method is of a larger service, but its uses require a discrimination seldom given in ordinary schoolroom practice. The teachers make too many outlines; the children too few. Too many outlines are written to be recited from; too few kept in mind as a guide to observation and reading, and as a basis for intelligent appreciation of and participation in discussion. One final outline used throughout the study of a subject or problem, from beginning to end, too often supplants many outlines representing the real successive views of the class from its first crude comprehensions up to its last schematic and well organized review. Wherever a subject has a content worthy of the name the topical method is a useful and essential mode of teaching. But its value depends entirely upon a discriminating and appropriate use.

H. S.

See Teaching, Types of; Teaching, Principles of.

TOUCH. — See Senses; Tactual Sensations.

TOULOUSE, UNIVERSITY OF, FRANCE. — The first university of the Middle Ages to be founded directly by a Pope. This foundation established the precedent for the principle that a *studium generale* could not be founded except by the Pope. The institution was established primarily as a defense against the Albigensian heresy, and theology was almost entirely in the hands of the Dominicans. Theological lectures were given in the time of Pope Honorius III (*c.* 1218). But the university became a reality only when, as one of the conditions of the treaty of Paris, Count Raymond of Toulouse was compelled, in 1229–1230, to pay the salaries of fourteen professors, in theology, law, medicine, and arts. The time was opportune for a new university, for, owing to the dispersion, professors and students could be attracted from Paris. The attractive features of Toulouse University were advertised and included the teaching of Aristotelian science. This first foundation, however, failed, owing to local opposition, failure to pay salaries, and the return of the professors to Paris. In 1233 a papal bull granted the *jus ubique docendi*, but without avail. No progress was made until a new charter was granted in 1245. The constitution of the University of Toulouse established a new precedent. It was modeled on neither Bologna nor Paris. The student rights were limited to a minimum and the power of control was placed in the hands of the bishops or the papal legate. The rector was elected from each faculty in rotation and took an oath of fidelity to the Chancellor. Since graduation in theology was not permitted until 1360, and since the subject was taught by the regulars, the predominating element was the legal faculty. In the fourteenth century there were in the university from 1500 to 2000 students. This was probably the period of its greatest success and until the eighteenth century it was decadent. By the time of the Revolution the university was practically nonexistent. From 1794 to 1803 lectures were given in the *Collège national*, later called the *Ecole centrale*. In 1802 a school of medicine was opened; in 1804 a school of law. In 1804 the Academy of Toulouse was established, with faculties of law, science, letters, and theology (Catholic and Protestant); and a school of medicine. As Toulouse was for long the only university in the South of France, it was able to make rapid progress. When neighboring institutions were established as at Bordeaux and Aix-Marseilles, it was somewhat weakened. In 1878 it received a faculty of medicine, and in the next year a library. The faculties at present maintained are in law, science, letters, and medicine and pharmacy. Toulouse is the center of a large number of institutions, some of which stand in close relation to the university. Among these are the *Ecole pratique de droit*, which prepares for legal, commercial, and administrative careers, and the *Ecole de notariat.* Connected with the science faculty are two observatories (astronomical and meteorological) and a number of institutes. Toulouse is one of the few French universities which possess an Olympic stadium for the encouragement of athletics, especially Rugby and Association football. The enrollment of students in 1910 was 2828, of whom 1325 were in the faculty of law.

See FRANCE, EDUCATION IN.

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TOURGEE, EBEN (1834–1891). — A self-educated musician. He was director of music at East Greenwich, R.I., and in 1867 he founded the New England Conservatory of Music, which he conducted until 1891. He was author of *Music in the Public Schools, The Church Choir,* and papers on music education. He was also editor of the *Massachusetts Musical Journal.* W. S. M.

See MUSIC.

TOWN, SALEM (1779–1864). — Author of schoolbooks; was for forty years a teacher in the schools of New York and several years a member of the New York legislature. He was the author of a series of spelling books, many million copies of which were sold, and joint author with Nelson N. Holbrook of a series of school readers. W. S. M.

See INSTITUTES.

TOWN SYSTEM. — The town system of school administration is peculiar to the New England States. Each New England state is divided into a large number of relatively small towns, which in size are not very different from the townships of the west. The county exists in New England, but is of no importance in educational administration. The term town, as used in New England, does not mean a village, as is the common use of the term in the Western states, but an irregular-shaped area of territory, included under one civil administration. It may and usually does include a town as such, or a city, but it also includes outlying villages and rural districts as well. Different villages within the towns have no separate government. The town controls, and among its most important functions are roads, drains, sewers, schools, poor-relief, public utilities, parks, libraries, hospitals, and taxation. Functions elsewhere exercised by the county belong in New England to the town.

Under the town system of school administration educational affairs are managed by a central body, elected by the people, and generally known as the town school committee. In a few cases in each state certain large towns have been reorganized recently under boards of education. In many matters the power of the school committee is regulated by general state law, and the minimum requirements which each town must meet are rather fully stated. Over the towns a state school officer or state board of education exercises some powers of supervision, though the chief function of such individual or body is to see that the towns obey the school laws of the state.

The schools of the central village or city, and those of the other villages and outlying territory are alike managed by the town school committee, and the whole are operated as a single group of schools. Each town thus forms a single school district, and the one town school committee exercises the functions once exercised by a number of district school committees. (See DISTRICT SYSTEM.) The schools of the whole town are managed just as roads, bridges, and the poor are cared for. The school committee of each town must provide a sufficient number of schools, but in doing so may close unnecessary schools and transport the pupils to central schools. The committee must also care for all school property, make all contracts, employ and pay all teachers and other employees, and do such other things, permitted by law, as are necessary for the proper administration of the schools of the town.

The result under this system is a pooling of effort by the entire town for the good of all but especially for the good of the outlying schools. It results, first of all, in an equalization of tax rates for schools throughout the entire town. All pay the same rate for schools, and all share in the same advantages. Other results are an equally long term throughout the entire town; better teachers employed for the smaller schools, and at better wages; a uniform course of instruction for all schools; free tuition for all in the central high school; special instruction for all in such subjects as music, drawing, and manual training; good supervision for all schools; and a systematic organization of the town's educational resources under a single small board, responsible to the people for results. The township system (*q.v.*) in the West is a somewhat similar but less well developed form of school organization, and the county system (*q.v.*) is an extension of the same principle to a still larger area. E. P. C.

See District School.

TOWNSHIP HIGH SCHOOLS. — See High Schools.

TOWNSHIP SCHOOL FUNDS. — See School Funds.

TOWNSHIP SYSTEM. — The township system of school administration is to be found chiefly in the states of the upper Mississippi Valley, and may be regarded as an adaptation of the New England town system (*q.v.*) to the new states to the west, which were peopled largely by westward migrations of New England people. The township system of administration, like the town system, attempts to make the township the unit of administration in school affairs. In place of the many district boards of school trustees or school directors, a single board of trustees manages the school or schools of the township as a unit. Almost nowhere, however, do we find the township system in simple and well-defined form. The exemption of the central incorporated city or town from township control, which is not the case generally in New England, greatly weakens the effectiveness of operation of the township system in the west. In some states where the township system is supposed to exist its operation has been so seriously interfered with by the establishment of independent districts that a township system of school administration exists only in name. The county oversight in the west also makes the township system different from the town system of New England, where county superintendents and county boards of education do not exist. Ohio, with its township organization and absence of county superintendents, comes nearer to the town system than any other state, but even here no very large percentage of the townships are completely centralized for school control.

The township system of school administration, like the town system, attempts to provide a systematic organization of the educational affairs of the township under one township board, or officer, subject in turn to the oversight of the county and state educational authorities. In some states the term town is used to designate what is virtually the township, showing the derivation from early New England settlers. In some states, also, the townships are irregular in size and boundary, but generally the township follows the congressional survey, and is a rectangular area, six miles square, and further subdivided into thirty-six sections, each one mile square. In parts of Ohio a township five miles square is found, and in others an irregular-shaped township exists.

In a well-developed township plan of school organization and control, the old districts are abolished or reduced to subdistricts, and a central township school board elected by the people from the whole township, manages the schools as a unit, as is the case under the New England town system. Ohio represents a well-developed type, though with many townships forming exceptions. In Indiana one township trustee manages the schools of each township, though here central villages and cities are organized under separate school boards, so that a pure township form of control exists only in a few rural townships. The presence of so many independent town and city school districts in all of the township system states is one of the marked defects of the township system as it at present exists, and constitutes one of the chief differences between it and the New England town system (*q.v.*). Where well organized, it has the same educational advantages as the town system, but the smaller population of the western townships, and the presence of a developing county organization and a stronger state control, makes it probable that a better future development for the states to the west would be toward a county system of school administration (*q.v.*) rather than toward the establishment of a strong township system. E. P. C.

TOXIC AGENTS. — See Intoxication.

TOXINS. — See Intoxication.

TOYNBEE, ARNOLD (1853–1882). — English economist and social reformer, born in London. Intending to enter the army, he read with that purpose in view, but his taste for history, poetry, and philosophy being stronger, he gave up the idea and began to attend lectures at King's College, London, and studied privately. In 1873 he entered Pembroke College, Oxford, and two years later transferred to Balliol College. While ill-health prevented him from pursuing an honors course, his striking personality won for him the respect and affection of many of his contemporaries at the university. He devoted himself especially to the study of economics and economic history, and on graduating in 1878 was appointed tutor and lecturer in these subjects. His lectures were well attended and attracted much notice. He dealt with recent economic history and social and industrial questions. To secure any social improvement he felt the importance of getting into immediate touch with the masses, and at Oxford he won many friends among the laboring classes, and was a member of the Board of Guardians and the local branch of the Charity Organization Society. With the same end in view he delivered popular lectures throughout the country on economic and social questions. His chief work was the *Industrial Revolution* (published in 1884). Toynbee's brief career was marked by his intense zeal for social improvement and some amelioration of the extreme individualism of his day, and by his deep sympathy with the needs and aims of the working classes. As a memorial to his name Toynbee Hall, the first university settlement, was founded "to link the universities with East London and to direct the human sympathies, the energies, and the public spirit of Oxford and Cambridge to the actual conditions of town life."

See SOCIAL SETTLEMENTS, EDUCATIONAL ACTIVITIES OF.

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TOYNBEE HALL. — See TOYNBEE, ARNOLD; SOCIAL SETTLEMENTS, EDUCATIONAL ACTIVITIES OF.

TRACHOMA. — A contagious disease, primarily of the eyelids, characterized by inflammatory thickening of the lid and granular condition of the inner membrane and discharge of variable amount. It is a serious disease leading often to injury to the eyeball and serious impairment of vision, is very prevalent in southeastern Europe, especially among the poor, and not infrequent in the United States among immigrants from these countries.

Recent studies suggest that trachoma is caused by infection with one or more of the group of hæmoglobinophilic bacilli producing primarily an acute inflammation, and secondarily in some cases a chronic productive inflammation. This hypothesis has been acted upon for the last year or two in New York City, and the cases of acute conjunctivitis, as well as those of trachoma, have been closely watched and treated in the schools and the homes. It is reported that now there are practically no cases of typical trachoma, but that clinically cases beginning as acute contagious conjunctivitis may develop into trachoma.

While cases of trachoma are not common throughout this country, medical inspection should always be on the watch for the disease among school children. When cases are discovered, the other children should be protected. Medical care is necessary and hospital treatment desirable. W. H. B.

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TRACK AND FIELD ATHLETICS. — Under this term are included all the track or running events (see RUNNING), the jumps, and the weight-throwing contests. These exercises represent the oldest forms of sport known in history, for they are in fact physical activities that played an important part in the everyday life of primitive man. The ability to run fast, jump over obstacles, and throw far and accurately was essential for survival under primitive conditions. There are references to competitions in running, jumping, and throwing in the histories of all nations and tribes. The human instinct to excel in feats of speed, agility, and strength always found expression among boys and young men in these exercises. The pioneers of modern physical education in Germany, Sweden, France, and England made free use of these natural activities in their programs of physical exercises.

The field events now in general use in college and school athletics are the following:

Jumping: running high jump, running broad jump, pole vaulting. The standing high jump, standing broad jump, hop, step and jump, three standing broad jumps, and pole vaulting for distance are also practiced in school and colleges, but rarely found on intercollegiate or interscholastic programs.

Throwing: putting the shot, twelve and sixteen pounds, throwing the hammer, twelve and sixteen pounds, throwing the discus. Throwing the javelin has been introduced in a few colleges since the revival of the Olympic games.

The field sports, when combined with running, constitute an exceedingly valuable form of physical education. In many schools and colleges the track and field sports are made a part of the regular prescribed courses in physical education. Running develops quickness and endurance, jumping produces agility, and throwing increases strength. The practice of all these sports in good form enhances normal development and bodily control. These exercises appeal to boys and young men far more than calisthenics and other forms of gymnastics, because they possess the element of competition. G. L. M.

See ATHLETICS, EDUCATIONAL.

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TRACTS. — During the period of the revival of the common schools in the United States (1830-1850), brief appeals were printed and widely distributed in Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, and Ohio. Such tracts usually contained one or two octavo pages of reading matter and were distributed at the close of public meetings. These tracts bore upon a variety of subjects — the need of common schools, the preparation of teachers, the value of subjects other than the three R's, etc. Henry Barnard said that he never called together the patrons of a school district to discuss with them education that he did not distribute among them at the close of the meeting a brief summary of the points presented in his address. Similar use was made of almanacs. As the almanac was sure to be purchased by every family, tracts were bound in with the almanac; and in some cases almanacs with some educational matter were especially prepared by those interested in the advancement of public education. W. S. M.

TRACTS. — See Nervous System.

TRADE SCHOOLS. — A type of school which has arisen in response to the demand for special training for productive occupations and industries to take the place of the old system of apprenticeship. The trade school may receive pupils in the last two years of their elementary school career as at Rochester, N.Y., or after they have left the elementary school, that is, at the age of fourteen. The course may be of short duration and specialized, or it may extend over two or three years and combine cultural subjects with general industrial training, as, for example, the Central Schools of London and many of the preparatory trade and technical day schools. In Germany the trade schools are known as *Gewerbeschulen*. See Continuation Schools; Industrial Education.

TRADE UNIONS AND EDUCATION. — Working men as a class have always been strong supporters of education, and the trade or labor unions have always insisted on the right of the working classes to a good education provided by a national system. It is largely on the question of trade education that the attitude of the trade unions has at times been doubtful. It is true that as early as 1829 at a meeting of working men and women, held in New York, a national system of education was demanded, giving "an enlightened, practical, and systematic course of instruction, including the knowledge of at least one trade or useful occupation, etc." And in the following year a demand was made at Boston for "a liberal system of education, especially in science which pertains to the mechanical employments." But, on the whole, equality of opportunity in a general liberal education rather than special industrial education was demanded. So the Trade Union Congress of England at a congress held in 1907 affirmed as its educational policy "a national system of education under full popular control, free and secular from the primary school to the university" and "that secondary and technical education be an essential part of every child's education." But while technical and manual training have always been welcomed, there was a tendency to show some opposition to the so-called trade school or industrial education (*q.v.*) under certain conditions. Succinctly stated the objections were as follows: the increase of trade schools would tend to flood the market with workmen whose training was incomplete, if not inefficient, with the result that wages would be lowered. Schools cannot at present teach a trade any more than the educational theorist can direct trade schools. Such schools would tend to supply the employers' demand for specialized workmen, more or less automatic machines, in place of all-round, well-equipped artisans. Finally, if trade education were given before the end of the elementary school period, children would practically be condemned to a career for life before their real development had begun. It is easy to see that the unions do not object to technical, manual, or industrial education which does not give special training but aims at a general scientific and theoretical attitude and industrial intelligence. At the same time the unions recognize that there is a place for special trade education for young workmen and in America many unions provide this education to their members. It is easy now to define the type of trade school or industrial training which the unions will accept. Such a school must be wholly under public control and publicly maintained; private trade schools are not only inefficient but they play into the hands of the employers. The normal boy or girl has as much a claim to professional training as the defective and abnormal child or the more fortunate 10 per cent who are able to proceed to the higher professional callings through state-aided universities and scholarships. In America the Dolliver bill was a measure proposed in 1910 to give federal aid for industrial education, but it failed to pass. The trade schools must aim to restore standards of efficiency, formerly maintained by gilds, and must develop labor power, not specialized skill. There should be an intimate connection between the home, the school, and the workshop, and teachers should be selected from practical workmen in touch with actual conditions. With regard to the curriculum, much emphasis should be given to the human side, to the position of the workman in the community as a citizen and as an economic factor. Granted these conditions, there are some labor leaders who would insist on graduation from a trade school as a requirement for entrance into the respective occupations, and it is hoped in this way to eliminate the unskilled, inefficient, and floating element from the working classes.

The American Federation of Labor pays considerable attention to questions of education. In 1903 a committee on education was organized and has undertaken the consideration of the child labor, the apprenticeship question, the effect on the wage earner of the graduates of trade schools, manual training schools, and schools of technology and industrial education. It has further recommended the introduction into schools of textbooks giving the modern views on social and economic questions such as the importance of the laborer in society, and has recommended lectures by union representatives. The committee has also attempted to organize unions of teachers, but with little success (see TEACHERS' VOLUNTARY ASSOCIATIONS), and has opposed the low rate of salaries and the use of political influence to secure teaching positions. In England the attitude of the trade unions is not so well defined. While they were able in 1907 to pass the excellent resolution already referred to, as recently as 1911, in a vote taken on the question of the abolition of the half-time system, 116,573 votes were given against abolition and only 29,933 in favor, an instance where personal greed and selfishness triumphed over the broader and more liberal views of the majority of the union leaders.

See further INDUSTRIAL EDUCATION.

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TRADES, EDUCATION FOR THE, IN AMERICA. — See INDUSTRIAL EDUCATION.

TRADITION. — Tradition denotes both a process and thing. As a noun, it designates a doctrine which is currently accepted in a community and which is handed on from generation to generation, being accepted on the authority of its past currency rather than because of any independent examination and verification. This use is often extended to cover any legend or story which is continuously handed down in a community, irrespective of the amount of belief attaching to it. As a process, tradition has a wider meaning, being used to cover the entire operation of transmission by which a society maintains the continuity of its intellectual and moral life. As a fact, tradition has of course always been operative. As a conception, its influence dates from the reaction against the rationalism of the eighteenth century. Rationalism, especially in France, had maintained, either overtly or implicitly, the desirability of making a *tabula rasa* of all beliefs derived simply from the past and accepted from custom and social authority. It upheld the ideal of a new construction of doctrines and institutions based upon conscious rational processes. As against this conception, the "traditionalists" asserted the necessity of utilizing the corporate and logically unproved beliefs of the past, and emphasized the educative value of institutions in continuously shaping all men's ideas and aspirations. The principle of social tradition was advanced from different points of view and in different interests by thinkers otherwise as unlike as Edmund Burke, De Maistre, and Hegel, and was accepted, in a modified form, by radicals of the school of John Stuart Mill. In contemporary discussion, it has been absorbed in the larger topic of social influences.

J. D.

See HEREDITY, SOCIAL; IMITATION.

TRAINING, ATHLETIC. — One of the most important characteristics of the development of intercollegiate and interscholastic athletics is the rapidly increasing importance attached to the systematic training of candidates for varsity teams. A complete system of training comprises three parts: (1) coaching; (2) medical supervision; and (3) training table.

The coaching is usually done by a professional who has achieved a reputation as an expert performer. He selects promising candidates, teaches the technique of the sport, regulates the amount of work done by each athlete, and picks out the competitors for each contest. A competent coach is a man of sterling character who knows how to teach; he must have a clear conception of the cardinal principle that the main object in athletics is the education and development of the individual; he must be willing to coöperate with the college officers in impressing upon students the importance of making good their obligations to the educational standards of the institution. Unfortunately, coaches are usually engaged and paid by athletic associations more or less independent of college authorities, and in many instances educational principles are sacrificed for athletic victory. The inordinate desire to win leads some coaches to demand so much work of athletes that they have not sufficient time and energy left to discharge their academic duties properly. The solution of this very important problem lies in the general adoption of the plan already in operation in a few institutions where coaches are appointed and paid by the institution on the same basis as instructors in other departments. The social standing and permanence of tenure thus assured would attract strong college men to the coaching profession.

The medical supervision of students participating in athletic contests is of great importance. The practice of employing a physician to examine all candidates for athletic teams, to coöperate with coaches in regulating the amount of training required of candidates, and to give emergency treatment in accidents is now the general rule in colleges and some secondary schools. The danger of serious injury is so great when weak or organically unsound young men indulge in violent exercise that educational institutions should provide adequate medical supervision in athletic training.

The training table for athletes is an American institution. The object in furnishing a special diet for athletes in training is to bring the individual athlete to the highest point of physical efficiency. This phase of athletic training had its origin in crude notions of the physiology of exercise entertained by English professional runners who came to the United States during the third quarter of the last century. They believed that superfluous flesh constitutes the greatest obstacle to athletic efficiency because it induces fatigue and interferes with respiration. Therefore, the early trainers sought to reduce weight by eliminating as far as possible from the diet of athletes fat-producing foods and liquids. Various modifications of a normal mixed diet have been advocated at different times by trainers and coaches, such as eating large quantities of raw meat or eggs because these foods are used by the organism in repairing and increasing muscle tissue. Experience and the influence of progress in the science of nutrition have resulted in the general adoption of rational dietaries for athletes. The diet furnished at the college training tables to-day consists of a variety of simple food of the best quality, properly cooked and well served. Pastry, sweet desserts, salads, fancy dishes, tea, coffee, and condiments are excluded. The cost of running a training table is from ten to fifteen dollars a week for each individual. The wisdom of running a training table for the athletes on the various college teams has been questioned very seriously. A number of the large universities abolished this feature of training during the last few years with entirely satisfactory results. This reform is a part of a general movement to eliminate extravagance, undue specialization, and other abuses from college athletics. The reform movement is gaining impetus and will undoubtedly result in simpler and saner methods of training. G. L. M.

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TRAINING COLLEGE FOR TEACHERS. — See Teachers, Training of, section on *England;* England, Education in.

TRAINING OF TEACHERS. — See Teachers, Training of.

TRAINING SCHOOL. — See Teachers, Training of.

TRANCE. — A lethargic sleeplike state, occurring in hypnosis (see Hypnotism), in hysteria (*q.v.*), and in other mental affectations. The condition may last a few minutes, or hours, or several weeks. Although the individual does not respond to ordinary stimuli, these are perceived, for they are often remembered in the conscious waking state. It differs from somnambulism, in which the acts are not consciously remembered except in a suspended somnambulistic state. It also differs from stupor (*q.v.*). The hysterical and mediumistic trances are more like the hypnotic conditions, although the individuals may remember the stimuli which were received during the trance. Often the phenomenon of catalepsy (*q.v.*) is present. The condition may be brought about by sudden emotional shocks in nervous individuals, and a mild degree is not infrequently found in young girls at or about the age of puberty. S. I. F.

TRANSCENDENTAL NUMBERS. — There are several possible classifications of numbers, such as prime and nonprime integers, integers and nonintegers, rational and irrational, and positive and negative. There is also a classification into numbers that are roots of algebraic equations with a finite number of terms with rational coefficients, which numbers are designated as *algebraic*, and those that are nonalgebraic. These latter are known as *transcendental numbers*. For example, the equation $a\pi^2 + b\pi + c = 0$ is impossible if a, b, and c are rational, and so is any other similar algebraic equation in which π is the unknown quantity. Hence we say that π is a transcendental number. It is because of this transcendence that it is impossible to square the circle by the use of the unmarked straightedge and the compasses. The subject does not properly enter into secondary education as at present arranged in American schools. D. E. S.

TRANSCENDENTALISM. — Taken generically, transcendentalism is a name for the philosophies that are antithetical to empiricism (*q.v.*), that is, for theories that appeal to a principle or a reality that transcends or goes beyond experience. The term received its current technical use from Kant. He made a distinction between the transcendental and the transcendent. The former signifies those *a priori* principles which are necessary to the existence of a cognitive experience, that is to an experience that can go beyond the assumed subjectivity of sensations and give them a reference to objects. To prove the necessity and the legitimacy of the transcendental in this sense is one of the chief purposes of Kant's critical philosophy. The transcendent, on the other hand, is illegitimate, signifying *a priori* principles that do not enter into the constitution of any possible experience. The Ideas of God, the Universe (as a real completed objective whole) and a spiritual soul substance constituting the Self are the leading transcendent conceptions. As Kant's successors attempted to break down this opposition, the philosophies of Fichte, Schelling, and Hegel are often called transcendentalism. In American thought, Emerson, Alcott, and the group of writers loosely associated with them are known as the New England Transcendentalists. In spirit, they were not so much opposed to empiricism in its technical sense as to intellectual Philistinism and to conventionalism expressed in social, moral, and religious beliefs. J. D.

TRANSFER OF PRACTICE. — See HABIT; also FORMAL DISCIPLINE, etc.

TRANSFERS. — See RECORDS AND REPORTS.

TRANSLATING. — See LATIN IN THE SCHOOL; GREEK IN THE SCHOOL.

TRANSPORTATION OF PUPILS. — See CONSOLIDATION OF SCHOOLS; RURAL SCHOOL PROBLEM.

TRANSVAAL. — See SOUTH AFRICA, EDUCATION IN.

TRANSYLVANIA UNIVERSITY, LEXINGTON, KY. — The oldest institution of higher learning west of the Alleghanies, was founded in 1798, and was the result of a union of Transylvania Seminary and Kentucky Academy, the former chartered in 1783, and the latter chartered in 1794. In 1865 Transylvania University and Bacon College were consolidated as Kentucky University. The institution bore the name of Kentucky University until 1908, when the name Transylvania University was resumed.

Henry Clay was a professor in the Law College from 1804 to 1807, and a Curator of the University until his death. Jefferson Davis, Albert Sidney Johnston, Justice John M. Harlan, and many other men of national fame, are among the alumni of the institution. The administration of Horace Holley, from 1818 to 1827, and that of Henry B. Bascom, from 1842 to 1849, were periods of unusual prosperity. During the regency of John B. Bowman, 1865 to 1878, a large increase was made in the endowment funds. Recently a quarter of a million dollars was raised for the endowment by President R. H. Crossfield (1908), and a campaign for $300,000 in additional funds is now under way. During the last session the enrollment of students was about six hundred. R. H. C

TRAPEZUNTIUS, GEORGIUS (1395–1484). — A Greek immigrant to Italy at the time of the Renaissance. He was introduced by Filelfo (*q.v.*) to Vittorino da Feltre (*q.v.*) who taught him Latin in return for Greek. So skillful was the teacher and so apt the pupil that Trapezuntius became one of the finest Ciceronian stylists of his day. He taught Greek in Vittorino's school at Mantua. He later became a papal secretary. He translated a number of Greek works into Latin, including Aristotle's *Rhetoric*, *Problems*, and *De Animalibus*, and Plato's *Laws*. In the controversy which raged round the merits of Plato and Aristotle, Trapezuntius was an Aristotelian and made an attack on Bessarion (*Contra Calumniatorem Platonis*).

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TRAPP, ERNST CHRISTIAN (1745–1818). — German pedagogue of the Philanthropinist (*q.v.*) school, born at Drage, near Itzehoe (Holstein), studied at Göttingen. In 1777 he became a teacher in Basedow's Philanthropinum in Dessau. In 1779 he was called as professor of pedagogy to the University of Halle, but his work there was unsuccessful, and he resigned in 1783. Some years later, when Campe (*q.v.*) was called to Brunswick to reorganize the schools there, Trapp followed him and was appointed professor and member of the school board (1786). The work of the board, however, met with great opposition, chiefly owing to the radical religious views of Trapp and Campe. In 1790 the board was abolished, and Trapp retired with a pension to Wolfenbüttel, where he died. His chief work is *Versuch einer Pädagogik*, Berlin, 1780. F. M.

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TRAPPIST ORDER, EDUCATIONAL WORK OF. — See CISTERCIANS, EDUCATIONAL ACTIVITY OF.

TRAVEL. — See EXCURSIONS, SCHOOL; GENTRY AND NOBLES, EDUCATION OF; TRAVELING AS EDUCATION.

TRAVELING AS EDUCATION. — Probably the origins of traveling as education are to be found in pilgrimages and in the household education of nobles in the Middle Ages, then in the wanderings of students after the foundation of the early universities (see BACCHANTS), also in the customs of the apprentices — the *Wanderjahre* — and, finally, in the revival of antiquity and the desire to see the famous places where the ancients had lived in Rome and elsewhere, and to collect manuscripts and other memorials of ancient times. A contributory ground of travel was the wish of the nobles and gentry to move in the midst of the polish and culture of court life, different from their own, especially in Italy. Pilgrimages, of course, are of very ancient date, and are characteristic of oriental religions. The education in nobles' houses led to traveling, directly, when the mansion or court was in a foreign country, and indirectly when it became necessary for the young noble to acquire foreign languages. This household education was a feature of the education of both sons and daughters of nobles. The "English Nation" in the University of Paris, and of Bohemia and the considerable number of English graduates at Padua illustrate this phase of traveling as education. The *Colloquia* of Peter Mosellanus and of others show the importance of the fairs at Leipzig, etc., in the bringing of resources to the traveled student far from home, by merchants visiting the fair from foreign countries.

But the beginning of traveling as education, in the recognized sense of the term, took place in Italy, and naturally with the Revival of Learning centering round Latin and Greek, all who wished to receive the inspiration of the *genius loci* in studies of antiquity, and also the advantage of the environment of the culture of the Italian ducal courts, turned to visit Italy, although other countries were added in the "Grand Tour" of the young nobles and gentry. One Englishman, in the middle of the fifteenth century, Reynold Chichele, went to Italy, and stayed there as rector of the University of Ferrara. Then followed the group of scholars, Grey, Free, Flemming, Gunthorpe, and Tiptoft, all of whom, as Einstein remarks, came under the influence of Guarino of Verona, then settled at Ferrara, under the protection of the ducal house of Este. Selling and Hadley went to Italy in 1464. Then came the Italian journeys of Thomas Linacre, William Grocyn, and Thomas Latimer in the last quarter of the fifteenth century. With the age of Erasmus and Colet, educational traveling had become an institution.

Thomas Fuller states that it was the fashion in King Henry VIII's reign to select "promising pregnancies" yearly from the universities "to send them abroad at the King's expense." It is said that John Leland was thus sent to Paris, where he came under the influence of Budæus, Sylvius Faber, Paulus Æmilius, and Ruellus, and then having learned methods of inquiry with regard to Roman and Grecian antiquities, became library keeper to King Henry VIII, and was appointed the King's antiquary. He was given a roving commission to search after England's antiquities and "to peruse the libraries of all cathedrals, abbeys, priories, colleges, etc., as also all places wherein records, writings, and secrets of antiquity were reposited."

The educational influence of travel was not confined to the classical student and scholar. The nobles and gentlemen (*q.v.*), beginning under the influences of Duke Humphrey of Gloucester (1391–1447) and afterwards under Henry VII, and then continuously, made the Grand Tour, including, at any rate, France and Italy. The influences from these travels showed themselves in two educational directions: (1) in the development of courtly manners, and the literature of manners (see MANNERS AND MORALS, EDUCATION IN), — especially through the Italian texts and English translations of the *Cortegiano* of the Count Baldassare Castiglione (translated by Sir Thomas Hoby, 1561), and of the *Galateo* of Giovanni della Casa (translated by Robert Peterson, 1576); (2) the travels abroad led to the educational study of foreign languages (see MODERN LANGUAGES, HISTORY OF THE TEACHING OF). Thus we are told that John Leland "not only perfected his former studies in the Greek and Latin tongues but also acquired great knowledge in the French, Italian, and Spanish languages. So also, with regard to linguistic acquisition of the Elizabethans, Sir Philip Sidney is a typical case. Further must be mentioned the accounts of the history, customs, and antiquities of foreign countries, brought into existence to record the experiences of travelers, and to meet the wants of prospective travelers. Thus in 1549, William Thomas after five years' residence in Italy published his *History of Italy*, a book full of interest for the young English gentleman. Thomas also wrote an Italian Grammar. Sir Thomas Hoby wrote a diary of his travels, which is extant in manuscript, from which Professor Sir W. Raleigh gives extracts in his edition of Hoby's translation of Castiglione's *Cortegiano*. Another distinct species of literature brought into existence was the series of writings on the art of travel. Beckmann has enumerated nineteen Latin treatises published in Germany in the last half of the sixteenth and beginning of the seventeenth centuries, of which one was translated into English as *The Traveiler* of Jerome Turler, 1575.

But England had its own protagonists of travel as part of general education. Not to mention the vast literature of records of adventurous seamanship (see GEOGRAPHY, HISTORY OF THE TEACHING OF; HAKLUYT, R.), the genuine adventurous traveler was well represented in English by Fynes Moryson, who traveled between 1591 and 1595, and published a folio of 900 pages, *An Itinerary, written by Fynes Moryson, gent., first in the Latin Tongue, and then translated by him into English*; *containing his ten yeares travell through the twelve dominions of Germany, Bohmerland, Sweitzerland, Netherland, Denmarke, Poland, Italy, Turkey, France, England, Scotland, and Ireland.* Moryson was an M.A. of Cambridge. Tom Coryat, the son of a clergyman, wrote an account of his travels, which he took in 1638, which is most noteworthy for its contents as well as its title. *Coryat's Crudities hastily gobled up in five month's Travells in France, Savoy, Italy, Rhetia commonly called the Grisons country, Helvetia alias Switzerland, some parts of High Germany and the Netherlands; newly digested in the hungry aire of Odcombe in the county of Somerset and now dispersed to the nourishment of the travelling members of this kingdom* (quarto of 655 pages). Amongst the earlier great literary men whose profit from Italian travel is reflected in their writings were Chaucer, Martin Luther, Rabelais, Cervantes, Montaigne, du Bellay, Milton, Sir Henry Wotton, Evelyn, and as artists, Rubens, Inigo Jones, and Velasquez (see H. N. Maugham, *The Book of Italian Travel*).

Amongst the early English books on the art of travel were the following: (1) Sir Robert Dallington, Master of the Charterhouse, *A Method for Travel showed by taking the view of France as it stood in the year of our Lord 1598*, London (? 1606). (2) Thomas Palmer, *An Essay of the Means how to make our Travels into Foreign Countries the more profitable and honourable*, London, 1606. (3) James Howell, *Instructions for Forreine Travell shewing by what cours and in what compasse of time, one may take an exact survey of the Kingdoms and states of Christendome and arrive at the practicall knowledge of the Languages to good Purpose*, 1642 and 1660. (4) J. Gailhard, *The Compleat Gentleman*, 1678, who had himself been much abroad as traveling tutor. The tutor, he says, must be a scholar, a traveler, of gentle breeding, "must have seen the world and frequented Courts, and must be communicative, not dull or silent."

The subject of the educational value of travel attracted the attention of English writers in the sixteenth and seventeenth centuries, opinions as to the balance of merits and demerits being divided. Thus Ascham in 1570, in the *Scholemaster*, is strongly of opinion that it is better to read Castiglione's *Cortegiano* in England than to visit Italy and run the risk of becoming Romanized and "Italianated." For the proverb says: *Inglese italianato e un diabolo incarnato.* If undertaken at all, the pupil should be accompanied by a responsible tutor. Mulcaster (*Positions*, 1581) thinks the gentleman better at home with a library and "standing studies" than with "stirring residence" abroad. Bishop Joseph Hall in *Quo Vadis* is adverse to the youth traveling, thinking the risks too great. On the other hand, Purchas in his *Pilgrims*, 1625, is strongly favorable, and Robert Burton in the *Anatomy of Melancholy* (1621) says there is "no better physic for a melancholy man than a change of ayre and variety of places to travell abroad and see fashions." Under proper safeguards Peacham (*Compleat Gentleman*, 1622) commends traveling as a part of the gentleman's education. On the whole, from the beginning of the seventeenth century onwards Shakespeare's view has obtained as to the danger that "Home-keeping youths" may have "ever homely wits." All the books on gentlemen's education from Peacham on to Vicesimus Knox (*Liberal Education*, 1781) contain at least a chapter *On Travel.* Many reproduce the substance of Lord Bacon's essay, *Of Travel*, which lays stress on methods of obtaining educational profit from traveling, for it is a "going to School." There must be a tutor; the languages of the countries must be learned; diaries be kept; maps and histories studied, and association with intelligent and responsible foreigners should be cultivated at the time, and kept up on returning home. By such methods travel is rendered educational. In addition, it is to be remembered that since the gentleman's travel often spreads over a year or two, or even longer, the Grand Tour was expected to be the occasion, at various suitable towns, to get training in dancing, wrestling, fencing, and "riding the Great Horse." The noble traveler, too, frequently stayed at Padua or Montpellier to study medicine, and at Orleans or Angers to study civil law.

In recent years the idea of educational travel has been brought from the sphere of the young gentleman's education to become a method of the people's schools. The application of the idea to schools is not new. Thus, Vittorino da Feltre (who was at Mantua from 1423 till 1446) took his pupils on a school journey to the Castle of Goito, in the summer heat. In a charming colloquy, entitled *Iter et Equus*, J. L. Vives in 1539 gives a dialogue between scholars set free on a holiday from school, making a journey on horseback together to Boulogne from Paris, and gives expression to a love of nature in the river, the nightingale, the goldfish, the scent of flowers, and the whole sense of refreshment. Milton in his *Tractate* (1644) throws into literary form one of the most striking educational parts of the *Tractate* in speaking of travel, for the English youth "in those vernal seasons of the year" to ride out in companies to all quarters of the land, "learning and observing all places of strength, all commodities of building and of soil, for towns and tillage, harbours, and ports of trade;" not only on land but to proceed to sea, "to the navy to learn there also, what they can in the practical knowledge of sailing and of sea-fight." F. W.

For the modern aspect see EXCURSIONS, SCHOOL.

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TRAVELING MUSEUMS. — See MUSEUMS.

TRAVELING SCHOOLS. — See CIRCULATING SCHOOLS; MOVING SCHOOLS; WALES, EDUCATION IN.

TRAVELING TEACHERS. — The traveling or itinerant teacher who moved from place to place and gave instruction so long as pupils and pay were forthcoming was a product of the Middle Ages. Sometimes such a teacher was compelled to travel through inability to obtain a license and recognition from ecclesiastical or municipal authorities; sometimes, and this case was the most frequent, the traveling teacher was a wandering scholar who would halt for a while to repair his resources and would leave as unceremoniously as he arrived. (See BACCHANTS.) Another type, however, arose later, when the desire to provide educational facilities became more established. While it was simple enough to appoint a teacher and establish a school in a town, village, or district when the population was not scattered, where it was widely dispersed, and traveling, for children at any rate, was precluded by distance, climate, and natural barriers, arrangements were frequently made to secure the services of a traveling teacher. Such for example was, and in some cases still is, the practice in Finland, Norway, Sweden, Wales, and the north of Scotland, parts of Australia, and in colonial America. (See CHARITY SCHOOL; DIVIDED SCHOOL; MOVING SCHOOL, and the articles on the countries referred to.) At present the traveling teacher survives in rural districts as the district supervisor, the traveling supervisor, and teachers of special subjects, who either visit school continuously, or only pay occasional visits to introduce new subjects.

TREITSCHKE, HEINRICH VON (1834–1896). — German historian, was born in Dresden and studied from 1851 to 1855 at the universities of Bonn, Leipzig, Tübingen, and Heidelberg. He began to lecture on history in Leipzig in 1858 and was appointed professor in Freiburg in 1863. In 1866, owing to his sympathies with Prussia in her war with Austria, he left Baden and went to Berlin, where he undertook the publication of the *Preussische Jahrbücher*, which he directed until 1889. The same year he became professor at the University of Kiel, the following year he was called to Heidelberg, and finally, in 1874, to Berlin, where he taught until his death. From 1870 to 1888 he was a member of the Reichstag, belonging first to the liberal and later to the moderate conservative party. He was an ardent admirer of Bismarck and supported him in his fights against the socialists as well as in his colonial policy. He was very brilliant as a lecturer and writer and enjoyed great popularity among the students. His chief work is his *German History in the Nineteenth Century*, of which he completed five volumes, reaching to the year 1848 (Leipzig, 1879–1894). It is characterized by a vigorous style and an intensely patriotic spirit, but also by extreme partisanship.

Other works of his are: *Historical and Political Essays* (Leipzig, 1865), *Zehn Jahre deutscher Kämpfe* (*Ten Years of German Conflicts*, 1865–1874), *Der Sozialismus und seine Gönner* (*Socialism and its Friends*, Berlin, 1875), etc. F. M.

TREMOR. — An increased motility phenomenon, not usually under the control of the will. The tremors are indicative of disease of the central nervous system and are relied upon for the diagnosis of the lesions. Tremors are coarse (of large groups of muscles), fine (of small groups, or of individual muscles), fibrillary (of single fibers), slow (two to five a second), and quick (over six a second).
S. I. F.

TRENDELENBURG, FRIEDRICH ADOLF (1802–1872). — German philologist and philosopher, born at Eutin, studied philology and philosophy at the University of Kiel, then at Leipzig under Gottfried Hermann, and finally at Berlin, where the philologists Boeckh and Buttmann and the philosopher Schleiermacher (*q.v.*) were his teachers. From 1826 to 1833 he was employed as tutor to a nephew of the Prussian Minister of Education Altenstein, after which he was appointed professor extraordinary at the University of Berlin. In 1837 he received a call to the University of Kiel, but in order to keep him in Berlin he was advanced to an ordinary professorship of practical philosophy and pedagogy, which position he occupied until his death. He lectured on the history of philosophy, particularly the works of Plato and Aristotle, on logic, ethics, pedagogy, and psychology. From 1835 to 1866 he was also a member of the *Wissenschaftliche Prüfungscommission*, or Board of Examiners for the higher schools of Prussia, and as such he exerted great influence on the pedagogical and philosophical preparation of secondary school teachers. In 1846 he was made a member of the Berlin Academy of Sciences; from 1849–1851 he was a representative in the Prussian legislature.

Trendelenburg's philosophy was based on that of Aristotle. His first publication (Leipzig, 1826) was on *Plato's Theory of Ideas and Numbers explained from Aristotle.* He then published a treatise on the *Categories of Aristotle* (Berlin, 1833), and an excellent edition of the same philosopher's book *De Anima* (Jena, 1833). This was followed by his *Elementa logices Aristoteleæ* (Berlin, 1836, 9th ed., 1892, Eng. transl., 1881), and *Erlaüterungen zu den Elementen der Aristotelischen Logik* (1842, 3d. ed., 1876). His *Logische*

Untersuchungen (1840) and *Die logische Frage in Hegels System* (1843) are directed against Hegel. In his *Historische Beiträge zur Philosophie* (*Historical contributions to Philosophy*, 3 vols., 1846–1867), he defines his position toward Aristotle, Spinoza, Leibnitz, Kant, and Herbart. In 1860 he published his *Naturrecht auf dem Grunde der Ethik*. In 1865 he became involved in a controversy with Kuno Fischer, which caused the publication of *Kuno Fischer und sein Kant* (1869). His addresses in the Academy of Sciences and a number of smaller papers, mostly on educational topics, are collected in his *Kleine Schriften* (1871). F. M.

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TRENT COLLEGE, ENGLAND. — See College, English; Grammar Schools; Public Schools.

TREVISA, JOHN. — See Anglo-Norman Schools; Black Death.

TRIAL AND ERROR METHOD. — See Ability, General and Special; Tests; also Practice Curve.

TRIER, UNIVERSITY OF. — A university established in the oldest city of Germany in the year 1473, a bull of Pope Nicholas IV having been granted as early as Feb. 2, 1454. Trier thus belongs to the second group of German universities, with Greifswald (1456), Basle, Freiburg i. Br., Ingolstadt, Mainz, Tübingen, Wittenberg, and Frankfurt-an-der Oder (1506), half of which are no longer in existence. The papal privileges secured by the Archbishop of Trier, who served as chancellor of the university, were sold by him to the city for 2000 gulden. The city having assumed the patronage of the institution, it issued an announcement in 1472 that a number of teachers had been engaged, and instruction seems to have been begun in the following year. The institution was so weak, however, that it became extinct three or four years later. It was resurrected in the year 1489, but never attained any special prominence, and came to an end in 1797. R. T., Jr.

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TRIGONOMETRY AND SURVEYING. — The first definite trace that we have of trigonometry is in the papyrus of Ahmes (*q.v.*). In this there is mentioned the *seqt*, which seems to have been equivalent to the cosine of the angle of slope of an edge of a pyramid, with respect to a diagonal of the base. There is, however, plenty of evidence of angle measure before this time, as witness the two fragments of astrolabes in the Babylonian collection of the British Museum, and the constancy of angle of slope (about 52°) in the pyramids of the fourth millennium B.C.

In Greece the mathematics was largely Egyptian and Babylonian before the fifth century, even in the schools of Thales and Pythagoras. With Anaximander (*q.v.*) the graphical treatment of the spherical triangle begins, and he also erected the first gnomon, the shadow of which must have suggested the idea of the cotangent relation, although the idea was never carried out in Greek mathematics. The Greeks used a primitive trigonometry only for astronomical purposes, and Hipparchus (*q.v.*) calculated a table of chords for use in astronomy. Heron (*q.v.*) gave several formulas in surveying that seem to have been of Egyptian origin, but they can hardly be called trigonometric. Ptolemy, who died *c.* 168 A.D., gives us our earliest knowledge of the method of computing chords. We have, therefore, among the Greeks a rudimentary trigonometry in which the chord is the only function used, and which was employed solely for astronomical purposes. The Hindus also used their primitive trigonometry only in astronomy, but instead of using chords of angles they employed half chords, which gave rise to the sine. They also used what is equivalent to the modern cosine and the obsolete versed sine. The Arabs joined the mathematics of the Greeks and Hindus, using both the chords of the former and the half chords of the latter. They preferred the half chord, however, and developed a good working trigonometry with this as the fundamental function. Al Battānī (877–927), the Ptolemy of the Arabs, distinguished also two kinds of shadows, the *umbra recta*, which finally became the cotangent, and the *umbra versa*, which became the tangent. Abul Wefa (960–998) computed tables with great care, and began a systematic arrangement of the theorems and proofs of trigonometry, thus laying the foundations for an independent science. He was the first to make use of the unit radius, the Greeks having combined the decimal and duodecimal bases in a radius of 120. Nasir Eddin (born 1201) wrote the first work in which plane and spherical trigonometry appears as a science by itself. He was a Persian but he wrote at Bagdad. He begins with the right triangle as we do at present, and has the sine theorem at the beginning of his treatment of the oblique triangle, as is still the case. Regiomontanus (1436–1476) is generally credited with having founded the science of trigonometry in Europe. As a matter of fact, he took most of his trigonometry from the Arabs, but he should have the credit of presenting this in a form available for European scholars. His *De Triangulis omnimodis Libri Quinque*, written in 1464 and printed at

Nuremberg in 1533, had a great influence. Among other Europeans who did much to establish the science may be mentioned Copernicus (1473–1543), who seems first to have used the secant; Rheticus (1514–1576), his pupil, who made the secant generally known, who was the first to make a single table of all six functions, and who first adopted the semiquadrantal arrangement of the tables; Viète (*q.v.*, 1540–1603), who knew the relation of sin nx to sin x and cos x; Albert Girard (1595–1632), who recognized the value of abbreviations for sine, tangent, and secant; Finck (1561–1646), who discovered the important formula

$$\frac{a+b}{a-b}=\frac{\tan\frac{1}{2}(A+B)}{\tan\frac{1}{2}(A-B)},$$

Pitiscus (1561–1613), whose trigonometry (1599) contains the addition formulas; Napier (1550–1617), Briggs (1561–1631), and Speidel (died in 1646), with their great work in logarithms.

In brief we may say that there are traces of trigonometry in Babylon and Egypt; that the Greeks and Hindus had a very crude trigonometry that they used in astronomy; that the Arabs developed the subject as a separate science; that it became established in Europe by the seventeenth century, the computations involved being simplified by the invention of logarithms, and the necessity for these computations contributing indeed to this invention. Since 1600 the science has become more analytic, particularly since the development of a good symbolism.

Educationally, trigonometry represents on the one hand a valuable line of applications, as in the mensuration of heights and distances, in surveying, and in engineering of all kinds. On the other hand, it is a distinct line of analysis, resulting in an interesting range of abstract theory, as when it is used to solve the cubic equation. The tendency on the part of the mathematician is toward the analytic side, while the practical teacher finds the applications the more valuable in the schoolroom. The science requires very little preliminary work in geometry if only the ordinary applications are taken, and hence it is sometimes asserted that it should replace most of geometry in the high schools. In the United States it is usually an elective subject in the third or fourth school year of the four-year high school, being taken by students preparing to enter technological schools of college grade.

The following points are at present discussed in relation to the teaching of the subject:—

May trigonometry not properly break into the course in plane geometry just after the study of similar figures? The objection is that the line of reasoning of the two sciences is radically different. The argument in favor of the plan is that interest is added and that the practical needs of geometry are more evident.

May the immediately practical part of trigonometry be joined with similar parts of algebra to form a workshop course for technical high schools that shall take the place of our present algebra and geometry? The objection is that the student will have no mathematical background, no store of the potentially practical. The argument in its favor is that it will capture the interest of an intellectually lower type of mind that needs to be held longer in school than it is at present.

Is it not possible to rearrange the work in trigonometry so as to put the immediately practical first, and all of the abstract theory last, to the end of securing such an interest in the former as to insure better work in the latter? This has not sufficiently occupied the attention of those who plan the courses, as will be seen by an examination of some of the current textbooks.

Is it not possible to concentrate the attention on the sine, cosine, tangent, and cotangent, letting the secant and cosecant be forgotten, as has been the case with the versed sine and coversed sine? If we consider the status of these functions when we have logarithms to assist in computation, it will be seen that they have lost most of their practical value.

Is it not possible to introduce a very elementary form of trigonometry, based on proportion, in the eighth grade, that shall create an interest in mathematics before the pupil begins the more serious work of the ninth school year? This has been done, although not generally under this name, and it is possible that a mixture of the utilitarian parts of mathematics at that time may prove to be of value later.

The question of the definitions of the functions as ratios instead of lines seems settled. The old line-values are useful for some purposes to-day, but the ratio concept is the more workable one.

There is no reason why the high school should not give a good course in trigonometry and surveying, as elective work. The subject is not difficult, and the applications are numerous, valuable, and interesting.

D. E. S.

TRIMMER, MRS. SARAH (1741–1810). — Writer on education, author of books for the young, and promoter of Sunday schools. She was the daughter of John Joshua Kirby, a painter of Ipswich. He wrote on perspective and was appointed teacher of the subject to the Prince of Wales (afterwards George III), who repaid his services by making him clerk of the works at Kew Palace. Kirby left Ipswich when his daughter (born on Jan. 6, 1741) was fourteen. At the house of Sir Joshua Reynolds she attracted the attention of Dr. Johnson by her knowledge of Milton.

In 1762 she married James Trimmer of Old Brentford, to whom she bore twelve children. "In the education of her daughters she had but little assistance, teaching them many things herself and putting them in the way to improve themselves by directing them to books for any information for which they might be desirous. The education of her sons also was in a great measure directed by her, their classical studies excepted." For the use of her little pupils she wrote an *Easy Introduction to the Knowledge of Nature*, which her friends persuaded her to publish. (The dedication is dated Dec. 12, 1780.)

From the time when Mrs. Trimmer "turned author" the history of her life is little more than the history of her writings. A complete catalogue of her works would have at least thirty items. These include (1) Instructive stories; (2) Picture books for nurseries; (3) Textbooks for Charity Schools; (4) *The Teacher's Assistant;* (5) Directions for the establishment and management of Sunday schools; (6) Pamphlets and periodicals advocating education on Church principles.

(1) Though the moral tales did not exhibit any skill in character drawing, they were very successful. The most successful was the *Fabulous Histories designed for the Instruction of Children respecting their Treatment of Animals* (1785), of which, under the title *History of the Robins*, there were many editions. There is an abridgment on the market even now, both in England and in America. (2) The picture books, about a dozen in number, consisted of engravings (rather well done) of scenes in history, ancient and modern, sacred and profane, with descriptive letterpress. (3) For charity schools there was a whole series, from a spelling book to scripture lessons, moral instruction from the Bible, and exemplary tales. (4) In the three volumes of the *Teacher's Assistant* the lessons of this series were divided into sections, each followed by a catechism on the matter. The circulation of the *Assistant* and of the books on which it was based received a great impetus from their adoption by the Society for Promoting Christian Knowledge. (5) Mrs. Trimmer was one of the earliest emulators of Raikes (*q.v.*). In June, 1786, Sunday schools, of which she must have been the chief founder, were opened at Old Brentford; in November she "had the unexpected honor of attending" the Queen, who had conceived the "pious desire of establishing" similar schools at Windsor; in March (1787) she published the *Œconomy of Charity*, offering guidance to ladies who wished to follow the royal example; and in the succeeding years she was often invited to give practical help. (6) Monthly from May, 1802, to August, 1805, then quarterly to September, 1806, Mrs. Trimmer published *The Guardian of Education* for the purpose of advancing "Christian education founded immediately on the Scriptures and the sacred offices of the Church of England." She discontinued the periodical in order to find time for another effort having the same purpose, — *A Comparative View of the New Plan of Education promulgated by Mr. Joseph Lancaster . . . and of the System of Christian Education founded by our Pious Forefathers* (November, 1805). This appears to have been the last of her books. She died suddenly on Dec. 15, 1810.

Mrs. Trimmer was not such a great woman as she thought she was, but if she was not very clever, she was prodigiously industrious; if she was rather bigoted, she was sincerely religious; she was a devoted mother, a kind mistress, a charitable neighbor, and an honest patriot. D. Sa.

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TRINIDAD. — See West Indies, Education in the Smaller Islands of.

TRINITY COLLEGE, DUBLIN. — See Dublin University; Ireland, Education in.

TRINITY COLLEGE, DURHAM, N.C. — An institution which grew out of Union Institute, an academy founded by Methodists and Quakers in 1838–1840. The Institute, which in 1851 became the Normal College, served as a training school for teachers for the common school system of the state, established in 1840, and as a college for the Methodist denomination. As a training college it was brought into connection with the state and the governor and superintendent of common schools became president and secretary *ex officio* of the trustees of Normal College. The right to grant degrees was obtained in 1853. In 1851 the North Carolina Conference indorsed the Normal College. In 1859 a new charter was obtained, by which Normal College became Trinity College, and the conference was empowered to elect trustees, a right extended in 1891 to the Western North Carolina Conference and the alumni. Great advance was made by the college under the presidency of John Franklin Crowell, elected in 1887. The curriculum was modernized by the introduction of the elective system, new departments were created, and the faculty was increased. He aimed to bring the college into closer touch with the new economic and social forces then rising in the South. Most significant were the removal of the college in 1892 from Randolph County to Durham, a manufacturing center that was in 1865 a small rural community, and the beginning of an endowment. President Crowell's work, however, was hampered by lack of resources. In 1894 he resigned and was succeeded by Rev. John C. Kilgo, in whose administration the standards of scholarship were raised, and Trinity Park School (Durham) was founded in 1898 as a preparatory school. The Carnegie Institution in its first report on American colleges ranked Trinity second among southern institutions in requirements for admission. The teaching force was also increased from ten professors in 1894 to twenty-four in 1910. The physical equipment was also enlarged, the number of academic buildings in 1894 being three, in 1910 eight. The productive funds were increased from $25,000 to $370,751.67 and annuities to the amount of $27,500 were also secured. In 1910 President Kilgo was succeeded by William Preston Few. By 1913, two additional buildings had been constructed and a movement was nearly complete to increase the productive endowment to $1,370,751.

The entrance requirements are fourteen units of high school work. The degrees of A.B. and A.M. are conferred on completing the appropriate requirements. In 1904 a School of Law was organized which gives a three years' course beyond the sophomore year, leading to the LL.B. In 1910 a School of Education, intended for secondary school teachers, was established. The enrollment in 1912–1913 was 451 students in the college. The teaching staff numbers twenty-eight members.

TRINITY COLLEGE, HARTFORD, CONN. — Founded as Washington College, in 1823. At first the institution extended the scope of college work, offering technical courses in agriculture, engineering, and applied sciences generally. This sort of education, however, did not appeal to the public as then constituted, and in a few years the curriculum became the traditional list of classical, mathematical, and philosophical studies.

While the charter contained a specific provision prohibiting denominational requirements for any officer or member of the College, and while the institution was from the first, and is still, entirely free from any ecclesiastical control whatever, nevertheless the promoters were largely members of the Episcopal Church. Its first president, the Rt. Rev. Thomas Church Brownell, was during his incumbency the Bishop of the Diocese of Connecticut, and the religious atmosphere has always been that of the Episcopal Church. In 1845 the name was changed to Trinity College. In 1885 a scientific course was reëstablished and the institution now gives the degree of Bachelor of Arts and of Bachelor of Science. Within the last ten years technical courses in civil engineering and electrical engineering have been added.

The equipment includes a library; physical, chemical, biological, and psychological laboratories; dormitories and a gymnasium. The number of students in 1912 was 257, the number of instructors 22. The productive endowment was $1,150,000. F. S. L.

TRINITY COLLEGE, WASHINGTON, D.C. — A Catholic institution for the higher education of women conducted by the Sisters of Notre Dame of Namur, founded in 1897. The entrance requirements are sixteen units of high school work. The college confers the degrees of A.B., B.L., B.S., A.M., and M.S. The enrollment of students in 1911–1912 was 165.

TRINITY UNIVERSITY, TORONTO, CANADA. — Founded in 1852. Since 1904 it has been a federated and constituent part of the University of Toronto. Faculties of arts and theology are maintained, but degrees are conferred only in the latter. Students in arts, men and women, take the examinations and degrees of the University of Toronto. St. Hilda's College for Women, and two secondary schools for boys and girls, respectively, are maintained in connection with Trinity University. The degrees in divinity (B.D. and D.D.) are conferred on candidates who are graduates in arts of three and eight years' standing, respectively, on completion of the examinations in theology. The enrollment of students for 1912–1913 was 197.

TRIPOS. — The term applied to the honor schools at Cambridge University. In history it goes back to the Reformation period, when a travesty was performed on Ash Wednesday of the practice of determining (*q.v.*) in Lent (*stare in quadragesima*). The mock disputation took place in the schools. An " old bachelor " sitting on a three-legged stool (whence *tripos*) disputed with the questionists or candidates for the bachelor's degree, called " brothers." A delegate, called " father," of the college, presented the candidates, and the proctors were present. The " old bachelor " came to be called " Mr. Tripos." The occasion afforded an opportunity for much humor which after the Restoration developed into scurrility and license. " Tripos verses " were written on the questions to be disputed. " Mr. Tripos " seems to have disappeared in the eighteenth century, but " tripos verses " continued to be circulated. In 1740 the ceremony was transferred to the Senate House, and a check was put on the excesses. In 1747–1748 the honor lists, giving the " Wranglers," " senior optimes," and " junior optimes," were printed on the back of the sheets bearing the " tripos verses," whence the lists themselves were called " Triposes." At first the examination was confined to mathematics only and this was given the name of " Tripos." When honor examinations were introduced, the term was transferred to them, *e.g.* "Classical Tripos," "Mathematical Tripos," etc.

There are now fourteen Triposes, as follows: classical, economics, historical, Indian languages, law and history, law, mathematical, mechanical, medieval and modern languages, moral sciences, natural sciences, Oriental languages, Semitic languages, and theological.

See Cambridge, University of.

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TRISECTION OF AN ANGLE. — See Geometry.

TRISTATE COLLEGE, ANGOLA, IND. — Founded in 1884 as the Tristate Normal College and incorporated under its present title in 1906. It includes besides the College, colleges of pharmacy and of engineering, and schools of law and music. The College is an accredited normal school for the purposes of the state teachers' certificates. (See Indiana, State of.) High school and preparatory courses are also given. There are no definite entrance requirements, and students may enter any of the courses at any place at the discretion of the faculty, the aim of the College being to "put a college course and its degree in reach of any young man or woman who has health and ambition." The degrees of A.B., Ph.B., and B.S. are conferred by the College. About 600 students are enrolled annually in all departments.

TRITHEMIUS (TRITTENHEIM), JOHANNES (1462–1516). — Early German humanist born at Trittenheim, near Treves. He was abbot of the Benedictine monastery at Sponheim (1483–1503) and later at St. Jacob, near Würzburg. He studied Greek and Hebrew with Celtes and Reuchlin (*q.v.*) and devoted himself to the collection of Mss. Through him the library at Sponheim was enriched with 2000 Latin, Greek, and Hebrew Mss. Trithemius stands at the parting of the ways between medieval scholasticism and Renaissance humanism, but while he possessed the encyclopedic knowledge of the one, he had not yet mastered the thorough scholarship and critical attitude of the other. He regarded the study of the classics not as an end but as a "means for higher aims," to which a student may apply himself "for the serious development of spiritual powers and to draw from them after the example of the Church Fathers ripe fruits for the welfare of Christian sciences." He was one of the prominent members of the Rhenish Society, which styled him the "Prince of national culture." He was the author of several historical and theological works, including *De scriptoribus ecclesiasticis* (a list of writers on any subjects whatever, who belonged to the clerical order), and *Catalogus illustrium virorum Germaniam suis ingeniis et lucubrationibus omnifariam exornantium.*

See Benedictines, Educational Activity of.

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Bursian, C. *Geschichte der Klassichen Philologie in Deutschland von den Anfängen bis zur Gegenwart,* Vol. I, p. 105 *sq.* (Munich, 1883.)

TRIVIAL SCHOOL. — A name first applied in the later Middle Ages to a school that taught the trivium (*q.v.*), that is, grammar, rhetoric, and dialectic. It was thus a school preparatory to the university. Later, in Renaissance times, the name was frequently applied to the first Latin school irrespective of whether all the trivium was included, the name indicating perhaps on the whole a less formal or dignified institution than the gymnasium; although at times both terms are applied to the same school in the same document. At Tübingen in 1557, the trivial school was the lower of two schools preparatory to the university, the upper in this case being called a pædagogium. The master of the trivial school was frequently given the title of rector. The curriculum varied with the varying conception of education during the centuries in which the term was used. As late, however, as 1619 it seems to have comprised in the Netherlands, at least, exactly the three original trivial subjects, as we gather from an official paper drafted by the Synod of Dort then sitting. The term trivial school passed out of use in the eighteenth century, at least so far as indicating a Latin school. At various times and places, however, the meaning of the term has changed, and an ordinary elementary vernacular school is indicated. An instance of this is known in New York in the late eighteenth century, while the practice is frequent at the present time in Austria. W. H. K.

TRIVIUM. — A term applied to the three inferior studies of the Seven Liberal Arts, *i.e.* grammar, dialectic, and rhetoric, as opposed to the *quadrivium*, *i.e.* arithmetic, geometry, music, and astronomy.

See Liberal Arts, Seven; Middle Ages and Education, etc.

TROPISM. — This term is generally used to designate an organic reactive tendency whose striking characteristics are orientation with respect to a source of stimulus and movement either toward or away from that source. Examples of this phenomenon are phototropism (the tendency to react to light by "seeking" or by "avoiding" it), thermotropism (similarly, the tendency to react to heat), thigmotropism (reaction to contact with objects), chemotropism (reaction to chemicals). Tropic (or, as they are also called, tactic) reactions are exhibited by both plants and animals. When an organism so orients itself with reference to a stimulus that the natural direction of movement is toward the source of the stimulus, the reaction is said to be positive. Reaction to light by orientation and movement toward it is positively phototropic. When the orientation is such that it directs the organism away from the source of the stimulus, the reaction is said to be negative. The moth, which is forced by a light to fly toward it, exhibits positive phototropism; and the earthworm, which by the same stimulus is forced to move away from it, exhibits negative phototropism.

At present the terms taxis and kinesis, as suffixes, are preferred to tropism by many authors. The principal difference in the phenomena to which they are applied is one of precision of orientation to stimuli. A tactic reaction is one which involves precise orientation; and a kinetic reaction is one which exhibits little evidence of orientation.

R. M. Y.

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TROTZENDORF, VALENTIN (1490–1556). — One of the great Protestant schoolmen of the Reformation period took his name from his native place, Troitschendorf, near Görlitz in Upper Lusatia. His real family name was Friedland. He received his early education in the Latin school in Görlitz and, in 1515, entered the University of Leipzig. In 1519 he went to Wittenberg, where he studied theology under Luther and Melanchthon. In 1531 he became rector of the Latin school of Goldberg in Silesia. Under his direction the school became very famous and attracted hundreds of students, not only from Silesia, but from the countries to the south and east. Like the other great schools of the time, Trotzendorf's institution was on a purely humanistic basis; Latin, Greek, and religion were the only subjects of instruction, the use of any language but Latin in conversation was prohibited. The school was organized after the model of the ancient Roman republic. Breaches of discipline were tried before a court of justice, composed of the older students. Trotzendorf himself, as *Dictator Perpetuus*, inflicted the necessary punishments. A series of calamities, famine, pestilence, and finally a conflagration, broke up the school in 1554. With a remnant of his students Trotzendorf moved to Liegnitz, where two years later he was struck down by paralysis during one of his lectures and died.

F. M.

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TRUANCY AND DELINQUENCY. — See Juvenile Delinquency; Reform Schools; School Management.

TRUANT SCHOOLS. — See Reform Schools; also Juvenile Delinquency; Penology, Educational Aspects of Modern.

TRUTH. — Truth is originally a social and moral concept, having to do with honesty and sincerity in communication. It is transferred to the corresponding intellectual virtue, veracity of thinking. But certain difficulties connected with the question of rightness of thinking carried the matter over into the metaphysical and epistemological region. In order to achieve valid belief or knowledge, thought must correspond to objects, to "Reality." Truth from this standpoint covers the entire problem of the relation of Mind and Existence, Thought and Reality. There are three typical theories regarding the nature of this relation: the Realistic, the Idealistic, and the Pragmatic. The first, the common sense view, takes correspondence to be an ultimate and unanalyzable quality, given in the very nature of the knowing relation. Our beliefs, judgments, propositions, etc., are true if they agree with the objects to which they refer. More specifically, judgments are true if the relation of terms or meanings which they express corresponds with the relation between objective elements or things. This conception was first definitely formulated by Aristotle. The conception appears adequate and final. But analysis shows that it merely restates the fundamental demand of knowledge that the results of thought agree or correspond with the things thought about: it states the problem as if it were a solution. Technically, the difficulty is manifested in the assertion that correspondence is ultimate and unanalyzable. How then is error possible, aside from wilful lying? Or, how do we know, in a given case, that the relation among our conceptions agrees with the relation among things? If we can compare a conception directly with a thing, error is wholly unnecessary; if we cannot, we are confined to the relation among our ideas and there is no way of ascertaining its agreement with that of things. The dualistic assumption underlying the common sense notion is its undoing. Hence the idealistic theory that truth is complete coherence or consistency among our ideas. Reality is conceived as a system of thought or meanings which is total and absolute. Our thinking is a reproduction of this absolute thought, or a partial participation in it. Incompleteness of thought always, when carried to its explicit realization, reveals itself as logical inconsistency, that is, contradiction, while the degree of consistency attained evidences the degree of embodiment in our finite thinking of objective truth or reality. This theory is derived from Plato, according to whom ultimate Being, Truth, and Reason are identical. While the Scholastic logic was based upon Aristotle, it also retained the gist of the Platonic conception in its identification of final Being and Truth with God.

The pragmatic conception reverts to the notion of correspondence, and attempts to analyze it. It interprets it as adaptation of thought to controlling things in the direction of a unified, satisfactory experience, not as bare conformity. Our beliefs and judgments are true in the degree in which they "work." Working means capacity to adapt themselves, through their expression in action, to things, this adaptation not being a passive accommodation but a use of things to get the end for the sake of which thinking exists. The essential points of this theory are the teleological character of all thinking (or that thinking exists for a specific purpose, not simply to reproduce or conform to what is already in complete existence), and the identification of truth with a tested verification of thought, this testing being experimental. Since, upon any theory, our only way of telling whether a given conception is true or not is to find out whether it is capable of experimental verification, pragmatism claims it is simpler to identify truth with the verified conception. The theory results from a union of the biological conception of thinking as purposive adaptation, and the experimental use of hypotheses in natural science. J. D.

See Hypothesis; Method; Pragmatism.

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TSCHARNER, NIKLAUS EMANUEL v. (1727–1794). — A Swiss statesman and philanthropist, born of a patrician family in Bern, was the prototype of Pestalozzi's ideal administrator Arner in *Lienhard und Gertrud.* In 1764 he became a member of the Council of his native canton, and in 1767 he was appointed governor of the district of Schenkenberg on the river Aar. It was there that he became a near neighbor of Pestalozzi, when the latter, in 1769, settled on the Neuhof. Tscharner showed great sympathy for his subjects, many of whom were extremely poor, and helped to support them by his private means. He introduced better methods of administration and tried to improve the rural schools. After the completion of his term of office, in 1773, he retired to his estate in Kehrsatz, near Bern, and devoted the rest of his life to agriculture and to literary and social work. F. M.

TUBERCULOSIS. — A chronic, infectious, mildly contagious, complex disease affecting man, cattle, and many other animals. Its cause was first definitely known when Koch, in 1882, discovered and isolated the tubercle bacillus, a rod-shaped bacterium about one six-thousandth of an inch long and one hundred-thousandth of an inch thick. The primary effect of the successful invasion of the body by this bacillus is the formation in the lungs and other tissues of certain characteristic cheesy nodules or tubercles (little tubers), whence the name *tuberculosis.* Many authorities believe that no further effect would be produced by this implantation of tubercle bacilli (which are frequently successfully met and destroyed or surrounded by cells of the tissues) were there not a secondary or accessory infection, particularly of streptococcus and staphyococcus bacilli, which associate themselves with the tuberculous activity, develop ulcerative processes and set free the tubercle bacillus for further invasion of the body. Consumption, then, in the sense of the characteristic wasting away of tissue, is not identical with tuberculosis, but rather a final symptom of the pathological changes set up by the tubercle bacillus.

The *forms* in which the tuberculous activity is manifested are by no means limited to various types of lung consumption. On the contrary, the bacillus, which enters the body usually through the nose or mouth, may take up its abode in various structures, especially in glands, bones, and joints. Thus, tuberculosis of the lymph glands of the mesentery through intestinal infection is the basis of the disease known as marasmus, while infection, by way of infected tonsils or teeth, of the cervical lymph glands, not infrequent in children, produces scrofula. However, not all scrofula, as that term is commonly applied, is tuberculosis, though the lymphatic diathesis which characterizes scrofula evidently favors the development of a true scrofula (in the narrower sense) when tuberculosis infection occurs. Tuberculosis of the bones, which is a more common manifestation than tuberculosis of the lungs in young children, especially between three and five years, commonly affects the spine or the ends of thigh and shin bones. The infection progresses slowly, causes pain, some fever, and inability to use the affected part. Gradually the bone softens and tissue destruction sets in; chronic abscesses with pus discharge often appear. Advanced spinal tuberculosis results in hunchback. These bone affections demand early and prolonged treatment under optimal hygienic conditions and such surgical assistance as is afforded by plaster casts, braces, etc. Tuberculosis of the joints, commonly of the hip and knee joints, usually develops between the fifth and sixteenth year, is frequently mistaken at first for rheumatism, and runs a course analogous to that of bone tuberculosis. Besides these relatively frequent forms, the infection may be the primary cause of other inflammations, *e.g.*, of the eye, ear, skin (lupus), or of the brain itself (tubercular meningitis, *q.v.*), or the real causal agency underlying other infantile and juvenile diseases, like convulsions, diarrhea, inanition, etc.

Symptoms. — The symptoms of tuberculosis, speaking more especially of lung infection, are not at first definite and characteristic, and in this mild and slow development lies the insidious danger and the fundamental obstacle in meeting and conquering the disease. The victim of a successful implantation of the bacillus may at first feel slight mental depression, irritability, loss of appetite, dyspepsia, sensitiveness to cold, and quick fatiguability — all disturbances that might well be ascribed to other causes. There follow loss of weight, a slight fever and a slight increase of pulse rate — three symptoms which should always excite suspicion and impel immediate recourse to a competent physician. Next ensue a persistent cough, expectoration of mucus and pus, increasing weakness, and copious night sweats. The average case terminates in death in about three years unless vigorously combated.

Conditions favoring Tuberculosis. — Popular opinion entertains various fallacious ideas concerning the causation of this dread disease. It is attributed to inheritance — tuberculosis " runs in families " — to damp air, to catching cold. Pneumonia is alleged to " turn into " consumption, etc. As is so often the case, these notions conceal a grain of truth. There are numerous conditions which favor the development of the disease. It is possible, for instance, to inherit a predisposition, a tubercular diathesis, as a family trait, but not to inherit the disease itself. Again, coughs, colds, and pneumonia, and many other illnesses doubtless lower bodily resistance and bring to light a preëxisting tubercular infection. These diseases are, as it were, the " cabinet " in which the "transformation act" is done, the vehicles that turn tuberculosis into consumption. A racial predisposition is exhibited by the negro and by the Indian. Other well-recognized conditions which favor the development of an infection are enlarged tonsils, adenoids, overwork, bad air, and poor food. All these, once more, spell " lowered resistance." Tuberculosis, like other infectious diseases, conforms to the equation: $D = \frac{I}{R}$, *i.e.* the intensity of the disease is the quotient of the intensity of the infection divided by the intensity of the bodily resistance.

How Tuberculosis is spread. — The tubercle bacillus may be carried from one individual to another in one or more of five ways: (1) by contagion (direct contact), (2) by objects handled or mouthed (food, eating utensils, pencils, towels, etc.), (3) by dust containing dried sputum, (4) by infected milk or meat, and (5) by moisture in the breath (spray or tiny drops expelled in coughing or even in talking). Disagreement exists as to the relative predominance of the five ways. The fourth, for example, raises the vexed question whether bovine tuberculosis is the cause of human tuberculosis. The fact that certain forms of tuberculosis are so frequent in children suggests conveyance in milk from tubercular cows, and we know that the bovine bacillus and the human bacillus are the same organism, modified by differences in environment. However, one cannot argue intertransmissibility from this relationship. " No indisputable case has been put on record," says one authority, " in which human tuberculosis has been contracted by the use of meat and milk." Again, the third avenue, once deemed most serious, is at least of doubtful prominence, since sunlight, fresh air, and drying rapidly kill these bacteria. Speaking generally, tuberculosis is a " house disease." Rooms, furniture, clothing, and other articles which have been long exposed to a consumptive and removed from the bacteria-destroying agencies, fresh air, sunshine, or artificial disinfectants, are the most common factors in the spread of the disease. It must be remembered that tuberculosis is but mildly contagious. Present opinion holds that a contact of short duration — a half hour or even two or three hours — would not give an implantation to a susceptible person, nor contact of two or three days or more to a person endowed with good powers of resistance. Moreover, contagion is not given off continuously until cavities have formed.

Treatment. — Against the bacillus itself science possesses at present no universally applicable positive specific, though inoculation with tuberculin is of undoubted benefit in certain forms of infection, particularly in infection of glands, joints, and of the urinary system. Treatment consists, therefore, primarily in aiding the body in its fight, in building up its resistance. The fundamental requirements are fresh air (preferably in a cold, dry climate), sunshine, abundant nourishing and easily digested food (practically a forced diet), and rest. These requirements may be secured almost anywhere, save in the homes of the very poor. Practically all cases can be cured when treated in the incipient stages, the majority when treated in advanced stages. Recovery takes from three months to three years or more, according to the extent of tissue involved.

Frequency and Mortality. — Tuberculosis causes 11.5 per cent of all the deaths in the United States and is the most frequent single cause of death in the fourth decade of life. Annual deaths from it per 100,000 population amount to 167 in the United States, 121 in England, 185 in Germany, 350 in Austria. There are estimated to be more than 500,000 cases in the United States at the present time, not counting latent infections. No wonder that the disease has gained the designation "the Great White Plague"! That infection is widespread is demonstrated not only by these mortality rates, but also by the discovery of healed tuberculous lesions in a surprisingly large number of autopsies of persons who have died from other causes. Thus the findings of Nägeli, in 1900, have led many to conclude that "every adult is tuberculous." But the most striking revelation of the past five years is the demonstration that *tuberculosis is a children's disease.* Deaths from lung consumption are relatively rare during school life, and cases of manifest tuberculosis do not usually exceed one per cent of the school population. But tuberculous infection is the rule rather than the exception. This fact has been brought out by the use of tuberculin inoculation in diagnosis. The earlier subcutaneous injection of tuberculin and the later Wolff-Eisner method of conjunctival reaction are objectionable for mass tests of school children, but the cutaneous inoculation method announced by Von Pirquet, in 1907, is simple, safe, and quite reliable for detecting latent tuberculosis. A drop of tuberculin is placed upon a small scarification of the skin of the arm and the appearance of the spot is compared the next day with that of a similar control scarification made at the same time but without tuberculin. The reaction is positive if the tuberculin inoculation produces more evident local redness or swelling. The use of this method in Germany has shown that from 5 to 50 per cent of children just entering school (5 to 6 years old) have been, or are then, infected, that in the second school year at least one child in three, and in later years at least one child in every two reacts positively. Indeed, in some advanced classes, 95 per cent of positive reactions were obtained.

Tuberculosis and the School. — Tuberculosis offers two main problems to school administration, the first hygienic, the second pedagogic. In the first place, there rises the problem of dealing with tuberculous children in the school. And this problem presents two phases, the handling of latent and of manifest tuberculosis. Tuberculosis must be diagnosed, treated, and cured in childhood. The Von Pirquet method now enables us to diagnose latent infection simply and promptly. Its discoverer urges the establishment of an international statistical inquiry by its use. To accomplish this purpose, every child should receive a cutaneous inoculation of tuberculin on entering school. All negative reactors should be retested annually. This plan would furnish valuable statistical information as to the prevalence of infection, and ages of greatest susceptibility, and would enable physicians, teachers, and parents to take prompt remedial measures for pupils who reacted positively at any time. Of course, positive reactors are not necessarily consumptive; they may have met or may be meeting an infection successfully. Nevertheless, such pupils should be kept continuously under the best hygienic conditions, should be guarded with special care if afflicted with scarlet fever, pneumonia, diphtheria, measles, or other resistance-lowering diseases. If positive reactors exhibit clinical symptoms indicating predisposition to tuberculosis and low resistance, they may to advantage be removed to fresh-air rooms or placed in open-air schools (*q.v.*). If, now, pupils with manifest tuberculosis are present in the schoolroom, they may be a source of danger to their mates. As a rule, however, whatever contagion exists in the classroom is more likely to emanate from the teacher, since teachers, as a class, are distinctly prone to the disease (probably from overwork, poor ventilation, and constant breathing of dust-laden air). The consumptive teacher endangers his pupils primarily not through respiration, but through objects, such as papers, pencils, and books, which he handles and which are subsequently handled by the pupils. These teachers should be excluded from service. If consumptive pupils have reached the stage of coughing and spitting, they must, of course, be segregated and taught in special classes under the best possible conditions. New York City, for example, has utilized for this purpose three discarded ferryboats moored permanently to wharves, and also maintains a roof-school at the Vanderbilt Clinic.

In the second place, tuberculosis presents a pedagogical problem. The modern "crusade against tuberculosis," which aims to minimize and ultimately to stamp out the disease, is essentially an educational movement. The next generation may be taught to combat the disease successfully, if the necessary instruction can be given to its members while passing through the public schools. To this end all teachers should be familiar with the salient facts concerning the nature, cause, treatment, and prevention of the disease and should instruct pupils painstakingly and impressively in these details. In several states efforts to this end are in progress: physicians and health officers have addressed meetings of pupils, and pamphlets of information and descriptive charts have been prepared and circulated among teachers. G. M. W.

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TUBERCULOUS CHILDREN, EDUCATION OF. — See Open-air Schools; Tuberculosis.

TUBINGEN, ROYAL WÜRTTEMBERG EBERHARD-CHARLES-UNIVERSITY. — The only German university with as many as seven faculties, established in the year 1477 by Count (later Duke) Eberhard of Württemberg. Humanistic tendencies were in the beginning very strong in the institution, at which the traditional four faculties were represented. Reuchlin and Melanchthon (*qq.v.*) were connected with the University in the early days. In spite of opposition on the part of several individuals, the Reformation was introduced, primarily through the influence of Duke Ulrich (1534), and the theological faculty soon became by far the most important of the institution — as it is one of the largest to this day. Tübingen owed its prominence in the field of theology to a marked degree to the establishment, in 1536, of the so-called *Stift* (dormitory), which was intended for the education of Protestant clergy. In 1559 a similar foundation, later called the *Collegium illustre*, was planned for the education of state officials, but this institution soon became nothing more than a home for noblemen from other parts of the country. It attained the period of its greatest renown during the close of the sixteenth and the beginning of the seventeenth century, only to die out during the Thirty Years' War. It was resurrected after the war and continued in operation until 1816, but never recovered its former distinction. The University itself suffered greatly during the Thirty Years' War, and the number of students and teachers gradually dwindled down to a mere handful. In 1635 the library was removed to Munich, and at the close of the war it seemed for a time as though the University would have to suspend operations. But owing to the interest manifested by Duke Eberhard III, the institution soon recovered its lost prestige. In the second half of the eighteenth century Duke Charles Eugene, whose name is perpetuated in the title of the University, began to take a deep interest in it, — an observatory was erected, a medical laboratory established, and funds for a library were raised, — but he soon transferred his interest to the so-called *Karlsschule* (attended by the poet Schiller), which he had founded in 1770, and which was moved to Stuttgart five years later. The competition was so keen that the Tübingen faculties of law and medicine all but succumbed to it, and the theological faculty was saved only by the fact that the *Karlsschule* possessed no divinity school. Fortunately for the University, the duke died in 1793, and the *Karlsschule* was disbanded by his successor in the following year. The Napoleonic wars left Württemberg double its former size, and no longer a duchy, but a kingdom. Under the first king, Frederick, the University was deprived of its autonomy and placed directly under the control of the state (1811). In 1817 a Catholic theological faculty was added by the merger of the Catholic university which had been founded at Ellwangen five years before, and a dormitory, the so-called *Wilhelm-Stift*, was provided for the students of this faculty. In 1817 a faculty of political science was established, and two years later a new constitution restored certain rights and privileges to the University. In 1831 the University constitution was remodeled along the lines that prevailed at the other German institutions of higher learning. A new main building was erected in 1845; in the following year a new hospital was built, and in 1863 a pure science faculty was organized. During the fifties the suggestion of moving the institution to Stuttgart received serious consideration, but the plan was soon abandoned. Since that time a whole series of new buildings — institutes, clinics, etc. — have been erected, and the institution, with the aid of a group of prominent teachers, has made satisfactory advances in many directions. Among the famous teachers connected with the University may be mentioned: Crusius and Nicodemus Frischlin in philology; Robert Mohl and Friedrich List in political science; Ludwig Uhland (the poet) and Keller in Germanic philology; Rudolf Roth in Oriental philology; Friedrich Vischer in æsthetics; Baur and Strauss in theology; Rümelin in statistics; Hugo Mohl in botany; Authenrieth, Wunderlich, Vierordt, and Bruns in medicine. The University attracts more students to its summer than to its winter semester, the town being beautifully situated. In the summer of 1911 there were in attendance 2263 students, including 72 male and 73 female auditors. Of the matriculated students 634 were enrolled in the faculties of philosophy and pure science, 376 in medicine (including dentistry), 372 in law, 168 in political science, 176 in Catholic, and 392 in Protestant theology, the latter being one of the largest theological faculties in Germany. In the summer semester of 1780 there were 229 matriculated students enrolled, in 1840 there were 724, and in 1900 there were 1544. During the winter semester of 1910–1911 there were 142 instructors, including 32 docents. The library contains about 530,000 volumes and 4175 manuscripts. The annual budget amounts to approximately $350,000. R. T., Jr.

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TUDOR PERIOD, EDUCATION DURING THE. — See Edward VI, King of England; Elizabethan Period in England, Education in; Free Schools; Grammar School; Henry VIII and Education; Reformation and Education.

TUFTS COLLEGE, BOSTON, MASS. — An institution established in 1852 as a college of the old type, giving training in the classics and humanities. In 1869 two new professorships were created, in theology and in civil engineering. These have grown into schools of theology and engineering. In 1893 a medical school was opened in Boston. In 1899 the Boston Dental College, a school of well-established reputation, was taken over as a department of Tufts College. The College only awaits the settlement of the estate of the late Henry J. Braker of New York to open a School of Business Administration. A limited amount of graduate work is done, leading only to the degree of Master of Arts.

In 1892 the College was opened to women on the same terms as to men. After seventeen years of trial, it appeared to both trustees and faculty that the interests of both sexes could be better served by separate instruction. The necessary legislation having been secured, Jackson College was opened in the fall of 1910 as an affiliated institution, under the direction of the trustees and president of Tufts College. It has a dean who is a woman. Otherwise its faculty is identical with that of Tufts.

The present organization and registrations are as follows: School of Liberal Arts, 156; Engineering School, 194; Theological School, 7; Jackson College, 93; Medical School, 317; Dental School, 285; Graduate School 7; total, 1057. There are 223 persons of different grades engaged in instruction in the several schools. The equipment consists of the Medical and Dental School building in Boston and 20 buildings at the original seat of the college. This is partly in Somerville and partly in Medford. Tufts College is not a university and does not require a college degree for admission to any department. The requirements for admission presuppose a four years' high school course and are those common to the other colleges on the Carnegie Foundation, and affiliated with the College Entrance Examination Board. F. W. H.

TUITION FEES AND CHARGES. — See Fees; Free Schools.

TULANE UNIVERSITY, NEW ORLEANS, LA. — Resulted from a contract entered into between the State of Louisiana and the Board of Administration of the Tulane Educational Fund, in 1884. By the terms of this contract, an existing institution, the University of Louisiana, was placed under the care of the Tulane administrators with such powers as would enable them to "foster, maintain, and develop a university in the city of New Orleans." It was at this time that the present name of the institution was adopted. The University of Louisiana had grown out of the Medical College of Louisiana, which was established in September, 1834. It received a charter from the legislature in 1835, and in 1836 issued the first degree in medicine ever conferred in the Southwest. A law department was added May 4, 1847. In 1859, on account of the Civil War, all academic instruction ceased, and no effort was made to revive it for sixteen years. After the restoration of civil government in Louisiana, a new board of administrators reopened the academic department. Beginning in 1879, the University received state aid until it came under the control of the administrators of the Tulane Fund.

The Tulane University of Louisiana was made possible by the bequests of Paul Tulane, a resident of Princeton, N.J., but for many years a merchant of New Orleans, who in the year 1882 donated his New Orleans property for the education of "the white young persons in the city of New Orleans." Subsequently, Mr. Tulane made other gifts, the total amounting to $1,050,000. Other endowments have enabled the administrators of the institution to realize their plans of building a great university in the city of New Orleans, chief of which was that of Mrs. Josephine Louise Newcomb, of $100,000, used in establishing the H. Sophie Newcomb Memorial College for the higher education of young white women. By her will the college received an additional bequest of about $2,700,000. Large additional sums have been given to the medical and other departments.

Through its different colleges the University is able to offer instruction leading to degrees in the arts and sciences, education, technology, medicine, law, dentistry, and pharmacy; and through its graduate department, courses leading to advanced degrees. Entrance to the institution is based upon the Carnegie requirements. The total enrollment of students for the college year 1911–1912 was 2536. The faculty numbered 276 during the year 1911–1912. M. J. W.

TUNISIA, EDUCATION IN. — See France, Education in Colonies of.

TUNSTALL, CUTHBERT (1474–1559). — An English Renaissance scholar and writer of an arithmetic, born in Yorkshire and educated at Balliol College, Oxford. He also studied at Cambridge and at Padua, where he graduated LL.D. He became Master of the Rolls in 1516, was English Ambassador to Charles V in 1519, was Bishop of London from 1522 to 1530, when he became Bishop of Durham, President of the Council of the North, 1537. During the Reformation he remained a Roman Catholic in doctrine. He took part in 1541 in the publication of the *Institution of a Christian Man* and the issue of the *Great Bible.* As a scholar Erasmus says he was a man "who not only outdid all his contemporaries in the knowledge of the learned languages but was also of an exquisite judgment and clear understanding, and likewise of an unheard of modesty." Sir Thomas More said in the *Utopia* that Tunstall's learning and writing were of "more excellency" than he was able to praise adequately. As an educationalist, apart from being one of the greatest of the English Renaissance scholars, Tunstall is famous for the first book on Arithmetic printed in England: *De Arte Supputandi libri quatuor,* London, Pynson, 1522 (Paris, 1538, Strassburg, 1554). F. W.

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TURIN, UNIVERSITY OF, ITALY. — See Italy, Education in.

TÜRK, WILHELM VON (1774–1846). — German schoolman and philanthropist, born in Meiningen, studied jurisprudence at the university of Jena and, in 1794, received an administrative appointment in the duchy of Mecklenburg. He became interested in the condition of the schools and visited a number of famous educational institutions, such as that of Salzmann (*q.v.*) in Schnepfenthal and of Pestalozzi (*q.v.*) in Yverdun. He became closely acquainted with Pestalozzi, and for some time even taught at Yverdun. He also published a book *Über Schul- und Unterrichts-anstalten mit vorzüglicher Rücksicht auf Mecklenburg* (*On Schools and Educational Institutions with special Reference to Mecklenburg*). In 1805 he opened a small school at Oldenburg, which he taught with the assistance of a teacher trained at Yverdun. In 1807, he removed his school to Yverdun, the pupils boarded with him, but attended Pestalozzi's institution where Türk gave instruction in languages and natural science. He wrote a book on *Sense Perception* (*Die sinnlichen Wahrnehmungen*), and another on the *Phenomena of Nature* (*Die Erscheinungen in der Nature*), the latter containing observations which he had made on excursions with his pupils through Switzerland. Owing to dissensions which broke out in the Yverdun institution, he removed, in 1811, to Vevey and established a school of his own, which soon became very prosperous. His work attracted the attention of the Prussian government, and in 1815 he was called as school superintendent (*Stadtschulrat*) to Frankfort-on-Oder. There he at once opened a normal course for teachers and wrote for them a *Guide for the Instruction in Arithmetic and Geometry;* the proceeds of this book he devoted to a foundation for the widows and orphans of teachers. Two years later he was transferred to a much larger inspection district, that of Potsdam, where he labored until his retirement from the public school service in 1833. For the rest of his life he lived at Klein-Glienicke near Potsdam and was active in philanthropic work, especially in connection with an orphan asylum, which he had founded in 1820 and which is still in existence. F. M.

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Allgemeine deutsche Biographie, Vol. XXXIX, p. 17.

TURKEY, EDUCATION IN. — General Conditions. — The existence of the Turkish power in Europe has been an anomaly of such deep import that the extent of the Asiatic division of the Empire and the numerical excess of its population are apt to be overlooked in the survey of its institutions. Of the area included in the possessions of the Sultan at the breaking out of the Balkan War, only 65,350 square miles, less than 6 per cent of the total, were in Europe; and of the total population (24,813,600), only 6,130,200, or 24 per cent. This was the most compact portion of the population, having a density of 93 per square mile as against an average density of 21. Crete, Samos, and Egypt, which are nominally under the Sultan's suzerainty, are not included in these estimates.

The commanding influence of the European division was due in part to the situation of the capital within its borders, an important consideration under any form of government, and doubly so where the autocratic and theocratic principles are inextricably united as in Turkey. But while the imperial power has been centralized at Constantinople, the mainstay of that power has been the Asiatic division, for here the Mohammedan religion is maintained in its most fanatical spirit and the vigorous Turkish race outnumbers any other one of the ethnical elements, and, according to some authorities, all the other ethnical elements in the Empire.

The absolute power of the Sultan has been tempered in the past by the principles of the Koran, by custom and guaranteed privileges, by formal constitutions, and by the pressure of European powers. The success of the "Young Turk" party and the deposition of the Sultan, Abd-ul Hamid II, added to these restrictions that of a new constitution, granted Aug. 5, 1909. The Sultan was no longer an autocratic ruler, and under the new conditions European Turkey was more fully assimilated to the western world and its distinction from the Asiatic division emphasized. The successive organization of Servia, Rumania, Montenegro, and Bulgaria as independent kingdoms, and the transfer of Bosnia and Herzegovina to Austria-Hungary, reduced Turkey in Europe to a comparatively narrow zone stretching across the Balkan peninsula from the Bosporus to the Adriatic. In this region just wrested from Turkish dominion European influences have been paramount, and of the entire population, two thirds are adherents of some one of the Christian creeds, and only one third Moslem; in Asiatic Turkey these ratios are reversed.

Among the influences that have given special character to education in the past are the peculiar type of domestic life, the military service required of every male citizen, the absolutism of petty officials, and religion. The Sultan is the virtual head of Islamism, which is the state religion; at the same time all creeds are tolerated, not less than nine non-Mohammedan religions being recognized. Prominent among these are the Greek, Roman Catholic, and Jewish. Every religious community controls its own monasteries, hospitals, and schools, and therefore, although there are government schools regulated by imperial ordinances, there is practically no national system of education.

Present System. — The present government has given much attention to the subject, but, so far, no radical change has been effected in the conditions established by the education law of 1869. This law was one of the series of reform measures adopted by Sultan Abd-ul-Medjid, who ruled the empire from 1839 to 1861. In 1846 this sultan created a superior council of education; in 1857 he appointed a minister of public instruction, and in 1869 the law regulating the service was passed. Heretofore religion had been the dominating factor in education; the secular element was now emphasized both in the administration and in the official curriculum of the schools. The law recognized public and private schools; the former under official supervision and regulations, the latter also subject to government supervision, but under private management, chiefly ecclesiastical. The main distinctions between the two classes of schools have arisen from their religious teachings and the close assimilation of the private schools to those of western Europe. The public or government schools are Mohammedan though open to adherents of other faiths.

Primary schools are of two orders: lower primary (*sibyan*); higher primary (*ruchdiyèh*). The law requires that a lower primary school shall be established in every village, except in cases where two or more villages combine for the purpose; wherever possible a separate school must be maintained for girls. Schools of this grade are provided and supported by the community; attendance upon them is compulsory for all children not otherwise instructed, the compulsory age for boys being from six to eleven; for girls from six to ten. Parents are subject to fine for neglect of this requirement. The lower primary school is, in fact, the traditional school of all Mohammedan countries, in which the Koran and the elements of ciphering are taught; but the Turkish law elevated the institution somewhat by requiring that the teachers shall possess a government certificate and by an extension of the program to include besides ciphering and the Koran (read or recited in Arabic) the elements of Ottoman history and of geography, and object lessons on familiar matters.

The higher primary schools were committed by the law to the charge and direction of the government, which is authorized to establish one school of this grade in every town having more than five hundred dwellings. The directors and professors, the latter numbering at least four for each school, are appointed by the minister of public instruction, and their salaries are paid by the State. The prescribed course of study covers three years and includes religious instruction, the grammar of the Turkish, Arabian, and Persian languages, bookkeeping, geometry, drawing, history, geography, gymnastics, and the native language of the respective communities. Separate schools of this order are required for girls, and a few have been established at Constantinople and other cities. Pupils completing the course of study and passing the official examination receive a certificate which admits them to secondary institutions.

Secondary education, as organized under the law of 1869, comprises preparatory schools (*idadiyèh*) and colleges (*sultaniyèh*). The program of the preparatory schools covers seven years (in the chief towns only five years) and is characterized by the usual studies of the former mosque school, with the introduction of the French language and literature, mathematics, and the sciences. In the larger cities the preparatory school of five years was evidently intended to be a preliminary stage to the higher secondary school or college, for which the official regulations prescribe a course of six years, leading to the University and higher special schools. The French language is the usual medium of instruction for the modern subjects. In fact, the only school of the higher grade existing in 1908 was at Constantinople; of preparatory schools there were eighty-one. These schools are supported by the state treasury, and the instruction is gratuitous for day students. If a boarding department is included, the living expenses of pupils are at the charge of their parents.

The regulations for the public schools of all grades emanate from the general government, but their enforcement is committed to the governors of the provinces (*vilayets*) and the executive heads of minor civil divisions.

Church Schools. — The native churches of the Turkish empire support their own schools, which follow pretty closely the program of other European countries, but maintain their distinctive types of religious instruction, thus also fostering their special national spirit.

Statistics. — From this brief outline it will be seen that the law of 1869 provided a broad basis for an educational system; but from the want of organic union between the diverse peoples of the empire it was impossible to impart a national character to the system.

On account of the conditions that have prevailed in the empire and the present unsettled state of public affairs, it is impossible to ascertain the status of the many provinces with respect to the existing provision for education; all summarized statements must be regarded as merely approximate. Estimates for 1911 give a total of 36,230 schools in the empire, with an attendance of 1,331,000 pupils. The number of schools is three times as great as the number given in official statements for 1908; allowing for all inaccuracies, it is undoubtedly true that there has been decided advance in this respect in the last four years. A much clearer idea, however, of the means of education in this complex empire may be obtained by considering particular cities or provinces, than by estimates pertaining to its entire extent.

Constantinople. — The process of transformation which is going on throughout the Turkish empire was anticipated in Constantinople by the direct action of the deposed Sultan, Abd-ul-Hamid, who was eager to make his capital a model city. In addition to many other improvements, he ordered the establishment of schools and higher institutions, including military schools and medical schools. The capital city was therefore well supplied with educational facilities when the revolution broke out. According to official reports there were, at that time, 561 primary schools of the lower order, of which 274 were Government schools and 287 private; of higher primary schools, there were 34 public and 31 private; and of secondary institutions, 11 preparatory and 1 lyceum or college. As the population was estimated at 870,000, it appears that there was one school for every 1366 inhabitants or one for every 200 of the normal school age. Judged by oriental standards, which take little account of facilities for girls, the provision was even greater. These estimates do not include the institutions for higher education, which will be referred to later.

Smyrna. — The manner in which foreign and modern influences are penetrating the Turkish empire through commerce and missionary activities is indicated by the combination of agencies in a commercial center like Smyrna, the second city of the empire in population (350,000). The majority of the schools in this city are supported by the Greek community which numbers 155,000, of whom 110,000 are Greeks of Ottoman nationality and 45,000 are colonists. The schools of the Jewish community are maintained chiefly by the *Alliance Israelite* whose seat is at Paris. In the city proper, this society has four schools with an enrollment of about 1000 pupils, and in the environs six schools enrolling 850 pupils. There are also three Jewish parish schools and several private schools for the same sect. The course of study is modern, including the sciences and commercial branches.

The agricultural school at Or Iehouda is maintained by the Jewish Colonization Association whose seat, also, is at Paris. On a model farm extending over some 30,000 donoums, or about 7500 acres, young men coming out of the primary schools of Turkey, Bulgaria, and Rumania, learn agricultural work both practical and theoretical. The instruction is given by special professors who have first studied at the Practical Agricultural School of Mikveh Israel, near Jaffa, and then in the superior agricultural schools of France. The young men prepared at Or Iehouda establish themselves as colonists, or at the farm itself, or in foreign lands.

French priests and members of the sisterhoods maintain in Smyrna some excellent schools, which have been the means of making the French language second only to Greek in general usage. The English and German colonists have their own schools, and American missionary colleges are educating about 600 native students. The Turkish government maintains in the city an imperial lyceum for advanced studies and a college of inferior degree. The former has 365 students; the latter about 450.

During the past year (1911), a Government agricultural school for teaching horticulture and viticulture was established at Sevdikeui, half an hour's distance from Smyrna by rail. Practical instruction is given on the farm, consisting of about 285 acres, besides lectures in the building, which has accommodation at present for forty students.

Turkey in Asia. — The following particulars show the educational status of a typical vilayet, Mamouret-ul-Aziz, at the beginning of 1912.

Nationalities	Population	School Attendance	Approximate School Attendance under 14 Years	Percentage of Illiteracy
Turks	218,168	11,750	7,750	90
Greeks	1,017	150	90	50
Armenians:				
Armeno-Gregorians	72,700	9,270	6,270	35
Armeno-Protestants	9,373	1,370	870	30
Armeno-Catholics	2,983	750	500	32
Syrians	1,506	290	210	50
Kurds	188,171	1,000	750	99
Total	493,948	24,580	16,440	—

Roughly speaking, the population of this vilayet is about half a million people and although this is a part of ancient Armenia, the Armenian inhabitants, as the table shows, do not constitute one fourth of the people; this same proportion is maintained throughout the region of Turkish Armenia.

The Moslem inhabitants, and especially the Kurds who are practically all of that faith, show little interest in education, although State aid is always given to their schools. In the larger towns of the district there is a fair supply of schools under Moslem and State control, but in the villages there are none. The Armenian communities, on the contrary, even in isolated villages are awake to the importance of educating their children of both sexes and tax themselves quite heavily to keep their schools running. In addition to their own language and Turkish, the Armenians try to have English or French taught. As a rule, all the Armenian males can speak Turkish and fully one third can read and write the language.

Under the former régime it was seldom that Turkish girls were given an opportunity to learn to read and write; but within the past few years several schools for girls have been opened in the larger towns of the district; crocheting and embroidery work and the simplest exercises in reading are about all that is taught at present. It will evidently be some time before schools for Moslem girls will be extensively patronized.

American Missions. — There are at present nine American societies working in the Turkish Empire, including Syria, carrying on Bible study, educational, philanthropic, and general missionary activities. This work employs about 750 American supervisors and teachers, and 2250 trained native assistants. The system of kindergartens, primary village schools, industrial training and high schools, and colleges, comprises some 670 institutions, with over 40,000 pupils. The medical department of the work embraces 36 hospitals and 45 dispensaries; and the records show that over 6500 patients are annually treated in the hospitals, and over 430,000 treatments are given by the physicians during the year. There is one full medical college with a pharmaceutical department and one school for the training of nurses. There are also 22 orphanages conducted by Americans, in connection with which an industrial work has sprung up employing over 10,000 people in addition to the 3000 orphans under training. The Sunday schools of these societies enroll over 40,000 pupils, and the distribution of Bibles, complete or in part, reaches 115,000 copies a year. The annual output of the two extensive printing plants averages about 75,000,000 pages.

Higher Education. — In Constantinople are concentrated the principal higher institutions of the Empire. These are: the university founded in 1900 by Abd-ul-Hamid to teach Moslem theology, mathematics, philosophy, law, and medicine — as yet it has only nominal existence; the Imperial School of Medicine; Imperial Art School, the Great National Greek School; the Greek Theological Seminary.

To the list must be added two unique institutions which are due to American initiative and philanthropic enterprise, Roberts College and the American College for girls in Constantinople. These are considered in the article on Missions, Educational Aspect of Modern.

Prospects. — The survey of the educational work of selected cities and districts illustrates the state of the entire empire in this regard and also the new purposes which are engaging the attention of government. Chief among these purposes are the provision of agricultural schools, engineering schools, and training colleges for teachers. It need hardly be said that the achievement of these purposes, upon a scale commensurate with the needs of the empire, depends upon the funds which they may command. Turkey has long been regarded as a bankrupt nation, but it has enormous resources, and the government is making a serious effort to reform the financial administration under the direction of an English official appointed in December, 1911, as Financial and Economic Adviser to the Ottoman government. In that year public instruction received from the state treasury an appropriation of 744,086 pounds (Turkish), equivalent to $3,274,000, or about thirteen cents per capita of the population. It should be considered, however, that the non-Mohammedan sects support their own schools, and while this distinction by creeds is fatal to the development of a national system, it insures financial resources far beyond those which the government can at present devote to that object.

The adherents of the Greek Church (Orthodox) form, it is estimated, 41 per cent of the population against the 50 per cent Moslems. The former not only give liberally to the cause of education, but receive generous contributions from their compatriots abroad. The Armenians, as already stated, tax themselves to the utmost for the support of education. Until the funds available from all private sources as well as from the public treasury are known, it will be impossible to estimate the expenditure for education in this transforming empire. A. T. S.

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TURNER SOCIETIES. — See Gymnastics; Jahn.

TUSCULUM COLLEGE, GREENEVILLE, TENN. — The oldest college west of the Alleghany Mountains, having been founded in 1794: Greeneville College was established in 1794; Washington College, 1795; Tusculum College, 1844. Greeneville and Tusculum Colleges were united in 1868, under the name Greeneville and Tusculum College; Washington and Greeneville and Tusculum Colleges were united in 1898 under the name of Washington and Tusculum College; and in 1913 the name was changed to Tusculum College. The student body numbers about 300; the faculty 16. The institution is coeducational and includes a preparatory department with a full four years' course, upon the completion of which the the student enters the freshman class. The degree of A.B. is conferred on completion of the required courses. C. O. G.

TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE, TUSKEGEE, ALA. — An institution for the education of negroes established in 1880 by an act of the Alabama legislature. Two thousand dollars was appropriated to pay the salaries of the teachers, but no provision was made for a building. The school was opened July 4, 1881, in a rented shanty church. There were thirty pupils and one teacher, Booker T. Washington, who has continuously acted as principal. In 1893 the institution was incorporated under the name of the Tuskegee Normal and Industrial Institute. During the first session the present location, consisting at that time of 100 acres with three small buildings, was purchased by Northern friends. The control of the school is vested in a board of trustees composed of nineteen persons.

The educational plant consists of 2400 acres of land; one hundred seven buildings, large and small, used for dwellings, dormitories, classrooms, shops, and barns. These, together with equipments, stock in trade, live stock, and personal property, are valued at $1,295,213. The endowment fund amounts at the present time to $1,871,647. One of the gifts that has contributed to this sum is a bequest of $38,000 from the estate of Mrs. Mary E. Shaw, a colored woman of New York. The movement to endow the school was begun by the graduates of Tuskegee on Dec. 1, 1890. It was not, however, until 1900 that the small sums that students and graduates were able to contribute reached $1000. Meanwhile the endowment had been increased from various sources. The first large donation, $50,000, came from Collis P. Huntington. The largest gift for endowment, $600,000, was made in 1903 by Andrew Carnegie. The current annual expense of running the school is $270,000, of which $150,000 has to be secured each year by contributions from the public at large. The accounts of the school are centered in the auditor's office. Separate accounts are kept for fifty-one different departments of the school, including the separate accounting of the different industries. The trade back and forth, inside the school, of which the auditor's office is a sort of clearing house, amounts each year to more than $600,000. This office has more than 4000 ledger accounts, of which 1500 are with the students; and in addition keeps the accounts of thirty-six funds, seventeen of which are endowment funds. The resident auditor is teacher of bookkeeping in the school. The auditor's office offers a postgraduate course to students desiring to become expert bookkeepers and accountants.

Since the foundation of the school, over nine thousand men and women have finished a full or partial course. They have gone out and are doing good work mainly as teachers and industrial workers. The total enrollment in the regular normal and industrial departments in 1912 was 1645. This included representatives from thirty-six states and territories and twenty-one foreign countries.

This did not, however, include 230 pupils in the training school or Children's House; 150 in the night schools of the village of Greenwood and the town of Tuskegee; 15 in the night Bible school classes; 40 in the town afternoon cooking classes. It did not include the 49 ministers in the summer school for ministers, the 305 teachers in the summer school for teachers, or the 1472 students in the short course in agriculture. The total number, therefore, of those who had the benefits of the school during the year was 3756. Of the 1645 regularly enrolled, all but about 100 board and sleep on the institute grounds.

Instruction is given in forty trades or professions. The industries are grouped under three departments; the school of agriculture, the department of mechanical industries, and the industries for girls. There is also a hospital and nurse training school. Each of these departments has a separate building or group of buildings in which its work is carried on. The agricultural school, in addition to its laboratories, has the farm and experiment station, where practical and experimental work is done. The farm includes 2300 acres; of these about 110 are used as an experiment station and a truck garden to supply the school's dining hall and the town market with vegetables; 90 devoted to orchards and small fruits; 840 devoted to general farming, and the remainder to pastures, woodland, and other purposes. The live stock consists of a dairy herd of 264 head, 106 of which are milch cows "at the pail," a beef herd of 160 head and 600 head of hogs. The horse barn takes care of all the work animals of the school, consisting of 170 head of horses, mules, and colts, which have an annual earning capacity of $36,100. The work of the farm is carried on by 250 students and eighteen instructors. The leading crops are corn, sweet potatoes, oats, rye, vetch, alfalfa, etc. Horticulture and floriculture are also taught. The mechanical industries include carpentry, brick masonry, woodworking, printing, tailoring, blacksmithing, shoemaking, founding, wheelwrighting, harness making, carriage trimming, plumbing, steam fitting, electrical engineering, architectural and mechanical drawing, tinsmithing, painting, sawmilling, and brick-making. The girls' industries include laundering, domestic science, plain sewing, dressmaking, millinery, mattress and broom making, and basketry.

There is a systematic effort to correlate the academic studies with the industrial training and practical interests of the pupils. By this means the industrial work of the students is lifted above the level of mere drudgery, and assumes the character of a demonstration. On the other hand, the principles acquired in the academic studies gain in definiteness, precision, and interest by application to actual situations and real objects. The academic department is divided into a night and a day school. The night school is designed for those who are too poor to pay the small charges made by the day school. The night school pupils spend five evenings each week in academic work; the day school pupils, three days each week. Teaching in the academic department is carried on by a faculty of fifty-two teachers. They are expected to visit every week some one division of the shops or farm and report upon it in order to find their illustrative material for their classroom work. Pupils, in their rhetoricals, read papers on and give demonstrations of the work they have done in the shops.

The Phelps Hall Bible Training School was established in 1892 to assist in improving the negro ministry. It aims to give its students a comprehensive knowledge of the English Bible and such training as will fit them to work as preachers or missionaries under the conditions existing among their people. The night Bible class gives an opportunity to ministers in the vicinity, who are not able to attend the day school, to improve themselves. The Ministers' Association of Macon and Adjacent Counties, which meets four times a year at the school, does much toward securing coöperation among the ministers for community betterment along undenominational lines.

The hospital and nurse training school was started in 1892. Seventy-four nurses have graduated and are doing good work in different parts of the country. The course in the training school covers a period of three years. The Andrews Memorial Hospital, which was erected at a cost of $50,000, affords facilities for the increasingly large number of operative cases that are brought to the hospital often from adjacent states. The Hospital Aid Society helps to make the people of the surrounding community acquainted with the benefits of the hospital and assists in caring for charity patients.

The institution does a large amount of extension work. The aim of the extension work is: (1) To change public opinion and turn the attention of the people in the direction where there is hope for them. (2) To educate the people on the soil, encourage better methods of farming, and so induce the people to stay on the soil. (3) To extend the work and influence of the school by encouraging the establishment of other schools similar to it, and by keeping in touch with its graduates and former students in order to direct to some extent their efforts to improve the communities into which they go. The extension activities now number thirty-six. Through them, it is estimated, over 100,000 people are reached, in one way or another, each year. The annual negro conference, begun in 1891, is attended by farmers from all parts of the South. The need of first-hand knowledge of conditions among negroes brought so many teachers and students to these annual meetings that it became necessary to hold the conference on two days, giving the first day to the farmers and the second to the teachers and students. This has resulted in the division of the work of the annual conference into the farmers' and workers' conferences. A conference agent is employed by the school to go into the rural districts and organize local conferences. The Farmers' Institute holds monthly meetings in the school's agricultural building. Here simple lectures and demonstrations covering the principles of agriculture are given. Institutes are also held in different parts of the South by teachers from the agricultural department. The short course in agriculture gives the farmers of the surrounding country an opportunity to spend two weeks at the school in study and observation. In 1912, 1472 persons took advantage of this work. Over 600 of these were young men and women. The Jesup Agricultural Wagon, by practical demonstrations in the field, carries the instruction of the school directly to the farmer. The farm demonstration work is carried on in coöperation with the United States Department of Agriculture and the General Education Board. The plan provides that a number of farmers in a selected county shall farm a small portion of their land under the direction of and with seed furnished by the Agricultural Department. A county fair is held each year. The work of improving the common schools is carried on through the rural school extension work. The people are assisted in building schoolhouses, lengthening their school terms, and securing competent teachers. Through mothers' clubs and sewing and cooking classes, the homes are improved. The principal effort of this sort is the Russell Plantation work, which is carried on by resident workers seven miles from the school.

The National Negro Business League has its headquarters at Tuskegee and is an important part of the work which the Institute is doing for the negro race. It aims to unite the successful negroes of the country in an effort to stimulate habits of thrift, to promote the establishment of banks and other business enterprises, and to encourage and direct the efforts of the people in their struggles to obtain economic independence. Since the Business League was founded in 1900, more than sixty banks have been started, and over 400 local Business Leagues have been organized.

B. T. W.

See Negro, Education of the.

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See also the references under Negro, Education of the.

TUTOR. — Literally, in the legal sense, a guardian or protector. The term is now used in the main in its educational significance of instructor or teacher. At Oxford and Cambridge the tutor is an official of a college who is charged with the educational and general moral supervision of a number of students. The tutorial system was introduced as early as the fourteenth century. Provision was made by Wykeham in the Statutes of New College (1400) to divide the educational supervision of the undergraduate students among a number of the fellows, who were to receive an additional allowance for the work of supplementing the lectures of the "schools." This practice was unlike that of Paris, where the head of a college gave the special instruction and in time was assisted by other "regents." The system introduced at Oxford, and adopted at Cambridge, in time led to a comparative neglect of the university lectures or the public lectures in "schools," at which attendance was for some time required formally. At the present time each student on entering a college at Oxford or Cambridge is assigned to a tutor who acts as his general adviser in selecting a course of study and in preparing for the examination. While it was possible formerly for two or three tutors to give instruction in all subjects, the increase in numbers of undergraduates and the multiplication of subjects have made this impossible, and instruction is now given by college lecturers in addition to the tutors. (See Cambridge, University of; Oxford, University of; Universities.) At Oxford the tutors of a college are selected from among the fellows; at Cambridge the tutors are not necessarily fellows. The tutor's duties extend beyond mere instruction. At Cambridge he acts as the intermediary between the college and the undergraduates in all official business, and is in most cases relieved from teaching, and at both universities he is expected to take a general interest in the general welfare of the students assigned to him. The preceptorial system of Princeton University is patterned on the tutorial system of the English universities.

In American colleges and universities the position of "tutor" is as a rule the lowest in rank of the instructing staff, with the exception of assistants who, as a rule, give no instruction. Tutors hold their appointment from year to year.

See Prefect and the Prefectural System; Usher; Universities.

TUTORIAL EDUCATION. — See Grammar School; Monitorial Schools; Prefect and the Prefectural System; Private

Schools; also Colleges, American; Public Schools, English; Oxford University; Tutor.

TYLER, WILLIAM SEYMOUR (1810–1897). — College professor; studied at Hamilton College and was graduated from Amherst College in 1830. He was tutor at Amherst from 1832 to 1834 and professor from 1834 to 1893. His publications include *Prayer for Colleges* (1854), *History of Amherst College* (1873), and several Latin textbooks.

W. S. M.

TYMPAN MEMBRANE. — See Nervous System.

TYNDALL, JOHN (1820–1893). — The English physicist, of importance in the history of English education for his advocacy of the teaching of science in schools. His views were not the theoretical opinions of the scientist, but were based on practical experience as a teacher of Queenwood College, Hampshire (1847–1848 and 1851–1853). (See Fellenberg.) In an address at the Royal Institution *On the Importance of the Study of Physics*, he insisted on the value of physics as a means of culture. Not only is physical science a means to "development of the mental faculties as the end of mental education," but it is the study which above all satisfies the innate curiosity with reference to natural phenomena. As against the rigid classicists Tyndall insists on the need of reorganizing systems of education to meet new needs; "I do not think," he says, "that it is the mission of this age, or of any other particular age, to lay down a system of education which shall hold good for all ages." . . . "While thankfully accepting what antiquity has to offer, let us never forget that the present century has just as good a right to its forms of thought and methods of culture as any former centuries had to theirs." It was nearly half a century before these views found even half-hearted acceptance among English schoolmen.

TYPE-STUDY, METHOD OF. — See Teaching, Types of; Teaching, Principles of; also Geography, Teaching of; Inductive Method.

TYPES. — While individual differences in mental functioning are widespread, certain characteristics recur so frequently as to give rise to the doctrine of types. Persons who possess the same mental characteristics belong to the same type. A number of attempts have been made to classify mental types, but most of them fail because they are not grounded upon fundamental distinctions. Among the most thoroughgoing attempts to formulate a principle of classifying types is that of Kraepelin, who bases his classification upon what he regards as fundamental characteristics of the work done in psychological experiments. These characteristics are as follows: (1) time relationships of mental performance; some persons are typically quick, others slow; (2) capacity for improving through practice; (3) capacity for retention of improvement through practice (general memory); (4) capacity for retention of sense impressions, ideas, movements, etc. (special memory); (5) sensitivity to new impressions and activities; (6) fatigability; (7) capacity for recuperation; (8) depth of sleep; (9) tendency to distraction of attention; (10) capacity for adaptation. Other schemes of classification have been offered by various writers with regard to various mental activities. Thus, it has been said that people may be classified as to their different types of attention, namely, sensory, motor, and indifferent. This distinction is based upon a study of various results of reaction-time experiments (*q.v.*). Binet regards persons as belonging to four different types of apperception: (1) descriptive, (2) connecting, (3) scholarly, (4) emotional. Among the most clearly defined types are the well-known ideational types, — auditory, visual, motor, and mixed.

E. H. C.

See Mental Measurements.

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TYPEWRITING. — See Commercial Education; Industrial Education; Secretarial Profession, Education for.

TYPHUS. — See Infectious Diseases.

UDAL, NICHOLAS (1504–1556). — Scholar, headmaster, school author, and writer of the first English comedies. His name was spelled in every conceivable variant of Woodale or Uvedale, he being of the Hampshire family of Uvedale, lords of Wickham. Born at Southhampton, Udal was admitted scholar of Winchester College in 1517. In June, 1520, at sixteen and a half years old, he was admitted scholar of the new college of Corpus Christi, Oxford, and was lecturer there from 1526 to 1528. On Feb. 28, 1533–1534, he published *Terentii Flores* or "Floures for Latin Spekinge selected and gathered out of Terence and the same translated into Englysche," dated at the Augustinian monastery, *i.e.* Austin Friars, he being then apparently usher of the School of St. Anthony's Hospital, London. (See London Schools.) At midsummer, 1534, Udal became headmaster (*informator ludi grammaticalis*) of Eton, with salary of £10, £1 for livery, 8*s.* 4*d.* petty receipts, and allowance of 23*s.* 6*d.* "for ink, and other things given to the grammar school by Dr. Lupton, provost." Here he produced, according to custom, a play every year at Christmas, paying on one occasion 1*s.* 4*d.* to the dean of Windsor's servant for the loan of some of his master's clothes for the boy players. In 1538 he was given the vicarage of Braintree, Essex, with license of non-residence and the same year was paid £5 for playing before Thomas Cromwell, the Lord Privy Seal. Thomas Tusser, in *Five Hundred Points of Good Husbandrie*, who had been a chorister of St. Paul's, records how

From Powles I went to Aeton sent
To learn straighwaies the Latin phraies;
Where fifty three stripes given to me at once I had;
For fault but small or none at all
It came to pass thus beat I was;
See, Udall, see, the mercie of thee to mee, poor lad.

Udal's rule of the rod at Eton was brought to an end by his being charged before the Privy Council, March 14, 1541, with being concerned with two scholars in stealing silver images apparently for Protestant iconoclastic purposes from Eton Chapel, and he was convicted of sodomy with one of the boys and sent to prison. From 1542 to 1551 he supported himself by literary work, translating into English Erasmus' *Apophthegmes*, a favorite schoolbook. In 1549 he composed the Privy Council's *Answer to the Articles of the Commoners of Devon and Cornwall*, which had attacked the English Prayer Book. On Dec. 14, 1551, he was made, in spite of his record, canon of Windsor. He was joint author with Princess Mary in translating Erasmus' *Paraphrases of the Gospels*. In 1553 he was appointed "scolemaster" to Mr. Edward Courtney, the Earl of Devon, who as a possible claimant of the crown was a prisoner in the tower. On Queen Mary's entry to London he composed *Dities and Interludes* as he had twenty years before on Queen Anne Boleyn's coronation. *Roister Doister*, the first English comedy, was perhaps one of these interludes. At all events it is first mentioned in the third edition of the *Rule of Right Reason*, the first Logic in English, published in January, 1553–1554, by Thomas Wilson. In it Ralph Roister's letter to Christian Custance, the heroine, is given as an example of "ambiguitie," the misplacing of stops making it an insult instead of a compliment. It was not written, as has been often said, either for Eton boys or for Westminster boys to perform, for it appeared twelve years after he left Eton and two years before he became headmaster of Westminster. On March 6, 1554, Udal was made rector of Calbourne, Isle of Wight, and on Nov. 8, 1555, was given the considerable legacy of 40 marks (£26 13*s.* 4*d* = about $1000 now) by the will of Gardiner, bishop of Winchester, who describes him as "my scolemaister," *i.e.* perhaps master of the old High School (*q.v.*) of Winchester. Amazing to relate, on Dec. 16, 1555, he was made master of Westminster school, the cathedral grammar school erected by Henry VIII on the suppression of the abbey. It has been often stated that he ceased to be master on the restoration of the monks Nov. 21, 1556, it being assumed that the school ceased. But Udal died in office and was buried at St. Margaret's, Westminster, Dec. 23, 1556. The abbey accounts show that the usher carried on the school till Michaelmas, 1557, when a new master was appointed and the school in fact never ceased. The history of schoolmastering can show no more astonishing record than that of Udal. A. F. L.

UNASSIGNED PERIOD. — See Incidental Period.

UNCONSCIOUS CEREBRATION. — The term was introduced by William B. Carpenter (1852 and later) as a more scientific designation of the principle underlying automatic and suppressed mental activity. A similar view appears in Laycock (1844 and later). It represents the psychological consideration of the mental procedures which Leibnitz treated as "obscure ideas" and Sir William Hamilton as "unconscious mental modifications." The group of phenomena thus surveyed and the systematic view thereof are now considered under the conception of the *Subconscious* (*q.v.*). The substitution of the more inclusive term "subconscious" for unconscious has been amply justified; "cerebration" was substituted by Carpenter as noncommittal for the contested term "reasoning." The range of phenomena thus included composes the general "operations below the plane of consciousness"; the latent mental ruminations, the ripening of judgment overnight; the processes of searching for a lost phrase, name, or mislaid article; the impressions registered by the way, without intent observation; the submergence or suppression of associative steps, with only the initial starting-point and terminal issues explicit in the mind; and again, the resurrections from the indirect field and avenues of knowledge revealed spontaneously or by such devices as the planchette or "automatic writing." While the term represents the position of an earlier stage of knowledge, the considerations associated with it were eminently suggestive and profitable. They enlarged the conception of consciousness by including and recognizing the specific status of the facilitating and interstitial procedures inherent in the operations of the mind. J. J.

Reference: —

Carpenter, W. B. *Principles of Mental Physiology.* (New York, 1886.)

UNDERGRADUATES. — A term used in England and America to indicate the college or university student who has not attained to the first or baccalaureate degree. See Col-

LEGE, AMERICAN; UNIVERSITIES; also CAMBRIDGE; OXFORD; and the various American colleges; also STUDENT LIFE.

UNDERSTANDING. — See JUDGMENT.

UNGRADED ROOM. — In the city school system where schools consist of large groups of classes more or less rigidly graded, there is need for individual instruction, hence the organization of ungraded rooms. There may be a number of ungraded classes if the school is large, each of which takes care of a specific line of individual variation. Thus, the ungraded class may be (1) for those who are temporarily behind the work of their regular grade owing to illness, transfer from another school system, or any other adventitious factor in the pupil's variation from grade; (2) for those who are backward or retarded because of more or less chronic physical or mental defect; (3) for those who are truant or delinquent and need special segregation with particular activities and controls; (4) for those children of a foreign-born population, who are too incompetent in the English language to enter the grade warranted by their experience and intelligence, and (5) for those who have tubercular, anæmic, or other tendencies toward disease that may be combated by ungraded open-air classes. H. S.

See DISTRICT SCHOOL; GRADING AND PROMOTION; SPECIAL CLASSES.

UNGRADED SCHOOL. — See RURAL SCHOOL.

UNIFORM SCHOOLS. — See SIMULTANEOUS SCHOOLS.

UNIFORMITY. — With the development of city school systems there has been a marked tendency toward centralized control and therefore toward uniform methods throughout the schools and grades of a single school system. The same tendency has prevailed over wider units, counties, and states, wherever a considerable degree of centralized power has been given to the educational authorities in charge of such units. The uniformities cover methods of organization, administration, teaching, and the course of study. The fact that the schools have a common purpose led to the false implication that uniform methods are required, whereas the opposite may be the truth. The achievement of a common end under diverse conditions requires diverse methods that take into account local variants. Thus, the children of a foreign-born population may require more time to cover the primary grades, a subprimary grade, giving a basis in oral English, being advisable for them, as it is not for English-speaking children possessing larger cultural opportunities. The assignment of compulsory attendance officers upon the basis of one to every three school districts may be an uneconomical arrangement, such officers being required less among the prosperous than among the working-class neighborhoods where economic pressure and factory opportunities lead to a more ready violation of the law. In a less aggravated way, an overuniformity of method tends to characterize the administration of larger units (counties, states) and smaller units (schools and classrooms). Doubtless large masses of children and teachers under a single management inevitably create a tendency toward centralization and the imposition of uniform methods. The local situations are too numerous for the chief officer or officers to know them in detail, and the control of detailed duties through many levels of subordinate officials tends to mechanize requirements. Contrastive tendencies are seen in comparing the informality of an isolated rural school with the highly formal organization of the largest city school systems. The criticisms that schools are "lock-step" machines for children and that teachers are losing their individuality are chiefly reactions against city school systems. Of late there has been ample evidence that supervisory officers are beginning to apply the principle of uniformity with more rationality. The appearance of specialized schools, ungraded rooms, individual teaching, flexible courses of study with minimum and optional standards, etc., mark the beginning of a more sane management. The principle of uniformity is a relative one. In so far as common purposes and common conditions exist, a uniform requirement is relatively safe. Thus, uniform requirements in the certification of teachers over an entire state represent a fairly safe method. In so far as there is variation in the purposes of schools and in the conditions under which they operate, wide uniformity is undesirable. The vocational schools and general cultural schools cannot be operated under the same traditions. A school for the poorest economic classes requires more adjuncts such as playgrounds, medical inspection, school nursing, free breakfasts, etc., than one in a community of the economically favored classes. The general principle is that uniformity should be as extensive as common purposes and conditions, and no more so. H. S.

See INDIVIDUALITY; PERSONALITY; SCHOOL MANAGEMENT; TEACHING, METHODS OF.

UNILATERAL LIGHTING. — See LIGHTING OF SCHOOLHOUSE.

UNION COLLEGE, COLLEGE VIEW, NEB. — A coeducational institution established in 1889 by the Seventh Day Adventists. Academic, collegiate, music, and business courses are conducted. The entrance requirements are fifteen units. The A.B. degree is conferred by the college. The enrollment in 1911–1912 was 284. The faculty consists of twenty-six members.

UNION COLLEGE, SCHENECTADY, N.Y. — An institution founded in 1795 under a charter which provides that no one religious denomination shall at any time have a majority in the board of trustees; hence the name "Union." In 1812 the present site of the college, on a hill overlooking Schenectady, was secured, and in 1813 a comprehensive plan for grounds and buildings was adopted. This plan was the work of Jacques Ramée, a French landscape architect who had been employed by the government in the development of the city of Washington.

Union was the first to break away from the Old World traditions and introduce new courses of study. As early as 1809 a course in modern languages was instituted. In 1828 a scientific course was established, and in 1845 a course in civil engineering was added, anticipating the demand for technical training which almost every other institution of higher education in America has since recognized. From this has developed the present general engineering department, offering courses in civil and sanitary engineering, with its now long established reputation.

A spirit of tolerance in the government of students made possible the establishment of the college fraternity system. The oldest of the Greek letter societies, Kappa Alpha, Sigma Phi, and Delta Phi, were founded at Union in 1825, 1827, and 1828 respectively. These were followed by Psi Upsilon in 1833, Chi Psi in 1841, and Theta Delta Chi in 1847. In the college world Union is designated as "the mother of the Greek letter societies." (See Fraternities.)

In 1895 an electrical course was added to the other courses in the engineering department, and in 1902 this course was greatly extended and thoroughly organized as a special department. By arrangement with the General Electric Company, whose plant in Schenectady is the largest and most comprehensive electrical manufacturing plant in the world, the college has such special advantages for students in electrical science as cannot be offered elsewhere.

Four courses are offered: the classical course, requiring Greek, leading to the degree of A.B.; the Latin-Scientific course, offering additional work in history and modern languages in place of Greek, leading to the degree of Ph.B.; the scientific course, emphasizing the work in mathematics and science, leading to the degree of B.S., and the engineering courses, leading to the degree of B.E. The postgraduate degrees of M.A. and M.S. are conferred upon graduates of the college on the completion of approved work and theses in course. The postgraduate degrees of M.C.E., M.E.E., and Ph.D. are conferred on graduates of this and other colleges who meet the specified requirements and complete the full work in residence.

The entrance requirements are fifteen units in the A.B. course and fourteen in the other courses. In the B.S. and B.E. courses three of these units are elective. The student enrollment in 1912–1913 was 366. There is a faculty of thirty-two members. Charles Alexander Richmond, D.D., LL.D., is president.

Union University, which was incorporated in 1873, includes Union College in Schenectady and the Albany Medical College, the Albany Law School, and Dudley Observatory in Albany; the College Pharmacy was created in 1881 and incorporated as a department of the University. The president of Union College is Chancellor of the University. F. C. B.

Reference: —

Hough, F. B. *Historic Sketch of Union College.* (Washington, 1876.)

UNION DISTRICT SCHOOLS. — See School Unions.

UNION DISTRICTS. — See Districts.

UNION SCHOOL. — See School Unions.

UNION THEOLOGICAL SEMINARY. — In the city of New York, an interdenominational institution for the training of ministers, was founded by New School Presbyterians in 1836. It is governed by a self-perpetuating board of trustees, half clergymen and half laymen. It had a teaching force in 1911–1912 of twenty-one, and a student body of 258. It is affiliated with Columbia and New York Universities. Its buildings, of English Gothic, occupy the plot between Broadway and Claremont Avenue and 120th and 122d Streets, and consist of a recitation building, a chapel, a library, a gymnasium, a dormitory for students, and residences for the president and professors. The library contained in 1912 about 100,000 volumes, and over 50,000 pamphlets. Three different denominations are now represented in its Board of Directors, five in its faculty, and eighteen in its student body. W. A. B.

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Brown, W. Adams. s.v. Union Theological Seminary. Schaff-Herzog, *Encyclopedia of Religious Knowledge.* Vol. XI, p. 376. (New York, 1912.)

Prentiss, G. L. *Fifty Years of the Union Theological Seminary.* (New York, 1889.)

Another Decade in the History of the Union Theological Seminary. (Asbury Park, 1899.)

UNION UNIVERSITY, JACKSON, TENN. — Founded in 1845 by the Baptist General Assembly of Tennessee at Murfreesboro. The institution was suspended during the Civil War and was reopened in 1866. In 1874 the University was removed to Jackson and chartered as the Southwestern Baptist University, the present title being adopted in 1907. An academy, a college, and a conservatory of fine arts are maintained. The entrance requirements are fourteen units. The University grants the degrees of A.B. and B.S. Of the total number of students in 1912–1913, 90 were of collegiate grade, and the total enrollment was 200. The faculty consists of seventeen members.

UNITED STATES BUREAU OF EDUCATION. — Created as a Department by Congress, March 2, 1867, but in 1868 reduced to a Bureau under the Department of the Interior, where it has since remained. At the meeting of the National Association of State and City School Superintendents, in 1866, Dr. E. E. White, of Columbus, Ohio, presented a plan for the organization of such a bureau, a proposition which had been discussed since 1864 in the National Teachers' Association, and a special committee was appointed to memorialize Congress for action. The bill was passed largely as a result of the personal efforts of General Garfield, and not because of any deep interest in the proposal itself on the part of Congress.

Both Congress and the states have always been very emphatically opposed to any effort to confer upon the general government any right to interfere with the state educational systems (see NATIONAL EDUCATION; and UNITED STATES, EDUCATION IN), and this feeling has resulted in a limitation of the proper work of the Bureau and a dwarfing of its possibilities for usefulness. Very meager annual appropriations have ever been made for it, and the possibilities of educational leadership have been neglected. Only in the past five years has the Bureau begun to receive appropriations for new and desirable additions, though as yet but a fraction of what is needed and has been asked for has been granted by Congress.

The work of the Bureau has been from the first essentially that of collecting and disseminating educational information. The *Annual Reports* have for a long time been of great value and usefulness. In 1870 the Bureau began the issue of a series of *Circulars of Information*. Up to about 1882 these related chiefly to education in other countries and nations, since which time such information has been printed in the *Annual Reports*. From 1888 to 1894, and from 1898 to 1903, the *Circulars of Information* were devoted to a series of historical sketches of education in the different states, thirty-six such volumes in all being issued. In 1906 a new series of publications, known as *Bulletins*, was begun, and these contain excellent material and have been of particular value. Since 1910 the Bureau has also mailed frequent short *Circulars of Information* giving digests of current legislation and new features of city and state school systems.

At the head of the Bureau is a Commissioner of Education, appointed by the President and confirmed by the Senate, and paid a salary of $5000 a year. Since the establishment of the bureau the Commissioners have been as follows: Henry Barnard, March 14, 1867, to March 15, 1870; John Eaton, March 16, 1870, to Aug. 5, 1886; Nathaniel H. R. Dawson, Aug. 6, 1886, to Sept. 3, 1889; William T. Harris, Sept. 12, 1889, to June 30, 1906; Elmer E. Brown, July 1, 1906, to June 30, 1911; Philander P. Claxton, July 8, 1911, to date.

The Bureau is organized into a number of divisions, at the head of each of which is a specialist. The divisions at present organized are: (1) school sanitation and hygiene, (2) higher education, (3) school administration, (4) rural education, (5) editorial division, and (6) library. The annual appropriation for maintenance for 1910–1911 was $72,200, with $50,000 additional for printing and binding.

E. P. C.

UNITED STATES COMMISSIONER OF EDUCATION. — See MINISTRIES OF EDUCATION; UNITED STATES BUREAU OF EDUCATION.

UNITED STATES, EDUCATION IN. — The United States, like Germany and other federated states, has no national system of education. However, the systems of the various states and commonwealths are all constructed on the same general lines and present diversities of only a minor character. These are discussed in the section on educational conditions of the respective articles on the state school systems; also in the article on EDUCATIONAL CONDITIONS, DIVERSITY OF. The activities of the national government regarding education are treated under the caption NATIONAL GOVERNMENT AND EDUCATION; the work of the educational bureau, corresponding to the ministry of European countries, is treated under UNITED STATES BUREAU OF EDUCATION (see also MINISTRIES OF EDUCATION). The general history of education in the United States is treated in the article on COLONIAL EDUCATION and in the historical sections of each of the state articles. The consideration given to education in the fundamental law is given in the article on CONSTITUTIONAL PROVISIONS. In the articles on the educational systems of the various states is given the detailed account of education in the United States. The history, function, and present organization of the various parts of the system are treated in special articles on the KINDERGARTEN; ELEMENTARY SCHOOL; HIGH SCHOOL; COLLEGE; UNIVERSITIES, AMERICAN ENDOWED; and UNIVERSITIES, AMERICAN STATE. The comparative study of the elementary school system or of the public school system in general is given in the articles on CITY SCHOOL ADMINISTRATION and STATE SCHOOL ADMINISTRATION. Most of the articles relating to the public school system, as MEDICAL INSPECTION, PLAYGROUNDS, Educational Athletics, Retardation and Elimination of Pupils, are in reality comparative studies of special aspects of education in the United States. These topics are arranged in a logical manner in the index and may be taken as a detailed study of education in the United States.

UNITED STATES MILITARY ACADEMY, WEST POINT, N.Y. — See Military Education.

UNITED STATES NATIONAL MUSEUM, WASHINGTON, D.C. — Established by Congress in connection with the Smithsonian Institution (*q.v.*) in 1846 to take charge of national collections, a nucleus for which was formed by the National Cabinet of Curiosities. The collections have been materially increased by gift, by exploration expeditions, by surveys of different kinds, and by purchase. At first supported out of the funds of the Institution, the museum is now maintained wholly by congressional appropriations. The museum is intended for "all objects of art and of foreign and curious research and all objects of natural history, plants, and geological and mineralogical specimens belonging to the United States." The development, however, has been mainly along the lines of natural history, geology, ethnology, and archæology of the United States. In recent years particular attention is being paid to the fine arts, national history, and the development of arts and crafts exhibits begun by the Exhibition of 1876. The museum is intended to aid research; specimens are put at the disposal of investigators, and duplicates are sent to colleges and secondary schools, while in the arrangement and labeling of specimens the interests of school children as well as adults are considered. There are published in connection with the Museum: *Annual Reports of the Smithsonian Institution, Bulletins and Proceedings of the United States National Museum*, etc.

See Museums; National Government and Education.

References: —

Smithsonian Institution, United States National Museum. *Report on the Progress and Condition of the U. S. National Museum for the Year ending June 30, 1908*, pp. 9–14. (Washington, 1909.)

U. S. Bureau of Education. *Circ. Inf.*, No. 1, 1890, pp. 64–78. (Washington, 1890.)

UNITED STATES NAVAL ACADEMY, ANNAPOLIS, MD. — See Naval Education.

UNITS OF ADMISSION TO COLLEGE. — See College Requirements for Admission.

UNITY. — Any standard by which we measure is a unit; from the Latin *unus*, one. The objects of counting are also called units, because we measure a number by the units it contains. Thus 1 foot, 1 yard, 1 inch, 1 mile, and so on, are units of length; $1 and 1 cent are units of value; a cube may become a unit of counting, and so on. The word *unity* is applied to a quantity which, when multiplied by any quantity of the system considered, gives that same quantity as the product. Thus $3 \times 1 = 3$, and we speak of 1 as unity. The word has, therefore, come to be considered in elementary arithmetic as synonymous with one.

Unity was not looked upon by the ancients as a number. Thus in Plato's *Republic* we have the question, "To what class do unity and number belong?" thus distinguishing between the two. It is quite possible that Nicomachus (*q.v.*), writing in the first century of our era, did not intend to exclude unity from the number field, for in speaking of polygonal numbers he says that unity can be no *such* number. It has been thought that Boethius (*q.v.*) misinterpreted this, and thus came to write *Unitas . . . numerus non est, sed fons et origo numerorum.* In the Middle Ages unity continued to be excluded from the number system. Thus Adelhard of Bath (*q.v.*), in his translation of Al-Khowarizmi (*q.v.*), or in the one attributed to him, says: *Quia unum est radix universi numeri, et est extra numerum. . . .* In the sixteenth century this ancient doctrine came to be questioned, and Hylles (writing in 1600) has this to say: "If I shall speake properly and exactly, I must say that one is no number, but rather, the beginning of number . . . and so consequently two is the least number . . . and thus I have shewed you the definition of number according to Euclide, and other auncient writers, but the latter writers, as namely Ramus, and such as have written since his time, affirme not only that an vnite or one, is a number, but also that euery fraction or parte of an vnite, is a number. . . . I do accompt it after a sorte for the first or least number . . . euen as an egg, with (sic) in power possibilitie containeth a bird though really and actually it is none, otherwise I take two, for the least number in the arte really." He also speaks of "an vnit or an integer (which sometimes I also cal an Ace)," and often uses the three terms as synonyms. Stevin (1585) said that the part must be of the same nature as the whole, and hence unity must be a number. To this "le grand Arnauld" replied that the argument was worthless, for a semicircle is part of a circle, but this does not make it a circle. After 1600, however, the better writers recognized unity as a number. The whole debate, of which only an outline has here been attempted, shows how trivial are many of the questions raised by educators as to the terms to be employed in the schools. D. E. S.

UNIVERSAL. — The logical opposite of the particular: variously conceived at different times and by different schools as an objective ontological archetypal Being in imitation of which and by partial participation in which particular things exist; as a class or genus of individuals, having objective existence and supplying the norm which limits the variations of particulars and gives them knowable character; as a law which while found only in particulars governs them; as a mental concept abstracted from individuals which alone exist; as a mere word a common noun which is applied to a multitude of things in spite of their particular differences. Much of the logical discussion of Scholasticism turned about the nature and meaning of universals, and differences upon this point were the cause of the formation of the rival schools of Realism, Nominalism, and Conceptualism (*qq.v.*). J. D.

See Law; Principle.

UNIVERSAL LANGUAGES. — See Languages, Artificial.

UNIVERSITIES. — **Definition.** — The word *Universitas*, borrowed from Roman Law, was commonly used to signify any corporation. Dr. Rashdall has pointed out how the Pisan prisoners at Genoa, in 1254, formed themselves for mutual protection into a *universitas* with a common seal. The earliest specialized appellation for what we now call a university was *Studium*, or *Studium Generale*, which Denifle has traced back as far as 1233. Attempts to explain these words *universitas* or *generale* as indicating a conscious breadth of intellectual scope are quite unhistorical, though we find such an explanation of *universitas* even in Erasmus. The natural and main meaning of *Studium Generale* was "a generally recognized place of study," — a national or even European, as opposed to a mere local, school. Implicit in this definition lies the further characteristic of a real university — the recognition of its degrees at other universities; or, as it was conceived in the Middle Ages, the *facultas ubique docendi* conferred upon its Masters. Other medieval terms for university were *Scolæ*, *Academia*, *Gymnasium*, *Alma Mater*, and (when the stress lay on the sense of "corporation") *Collegium*, *Societas*, *Communio*, *Consortium*. We may say that the ruling idea of medieval university organization was that of a trade or craft gild, with its system of apprenticeship developing through journeymanship into mastery, its corporate rights and its corporate responsibilities. With this, as with nearly all other gilds, the earliest origins are lost in obscurity; but it is evident that the growth was gradual, tentative, dependent upon place, time, and circumstance, and often half unconscious of the final goal. No two universities followed quite the same course; it is perhaps Denifle's weakness that he tries to define too precisely, especially in treating of the necessary relations of the University to Church and to State.

Rise and Development. — If we except Salerno, which was never more than a school of medicine, the two earliest universities are by far the most important for the study of origins.[1] Bologna and Paris, growing up about the same time, typify the two main classes into which all medieval universities fall. Constitutionally speaking, Bologna was a corporation (or rather a plurality of corporations) of scholars; Paris was a corporation of masters.

Bologna and the Southern Type. — Bologna had gradually become the most important of a number of Italian schools which derived more or less directly from classical times. The Lombard nobility, especially, had preserved educational ideals which in Northern Europe were maintained only by the clergy; Lanfranc's biographer tells us how he, "being of noble birth, was taught from his boyhood upward in the schools of liberal arts and secular laws, according to the custom of his country" (Chap. V). This demand for legal learning was greatly stimulated by the growth of the Italian communes in the latter part of the twelfth century; "the intellectual Renaissance of the twelfth century [in Italy] . . . was indeed only the other side of a political renaissance" (Rashdall, I. 98). The schools of Bologna, already famous for the study of practical rhetoric and composition (*dictamen*, *q.v.*), developed into specialized law schools under Irnerius somewhere about the years 1100–1130. Thenceforward no longer Ravenna, but Bologna, is the great Civil Law School of Italy and Europe. From about the time of Irnerius's death, the study received a still further stimulus through the lectures and writings of Gratian (*q.v.*), whose *Decretum* became at once the authorized textbook of Canon Law (*q.v.*). The Emperor Frederick I, in 1158, issued a charter of protection to all students throughout Lombardy, which seems to have been specially called forth by the rapid growth of the Bolognese schools. Though this charter recognizes no definite and legal corporation of masters, yet its provisions make it probable that the numerous teachers had in fact already organized themselves into some sort of gild. A Papal bull of 1189, regulating the students' rents, brings us one step nearer to an organized university; and a few years after this (if not already before) we have evidence of definite *universitates*

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[1] Salerno had a *studium generale* as early as the eleventh century; but it possessed no *universitatem* beyond a body of Masters, of whose organization very little is known, and whose degree-giving powers were for the most part usurped by the state authorities. Dr. Rashdall does not seem to speak too strongly when he remarks, "Nothing approaching a regular university ever existed there" (i. 82).

scholarium at Bologna. The schools were frequented by students from all European countries, of whom the majority were probably grown men. It was natural that each important nationality should form itself into a gild for mutual protection, just as there were *universitates Judæorum*, and gilds of German merchants, in different Italian cities. This consideration is emphasized by the fact that Bolognese citizens were excluded from the scholastic gilds; the fact is that they enjoyed their own city laws, and therefore needed no further protection. It is almost certain that there were at one time four such *universitates* at Bologna, as there certainly were in its daughter city Vicenza and its granddaughter Vercelli; and probably one of these, the Ultramontane, had itself been welded together from a larger number of separate national gilds — German, French, English, etc. At least as early as 1244, however, a process of simplification had taken place. We now find only two *universitates*, the *U. Citramontanorum* and the *U. Ultramontanorum*, "closely allied, but distinct, . . . each under a rector of its own." It would seem better to speak of these two *universitates* as one university in the modern sense, than as two. There was at Bologna only one *Hochschule* of Law, insists Denifle (p. 155); the two rectors were *Rectores Scholarium*, not *Rectores Scholarum*; (*i.e.* bore rule over the gildsmen and not over their studies); the term *Rector* itself was originally rather a gild term than a school term; and the statutes of the German Nation at Bologna (which have luckily survived) are ordinary gild statutes. The teachers, being always in early days citizens of Bologna, were thus formally excluded from the student gilds. We are here presented with a phenomenon most strange to modern ideas, though most natural at its own time and under its own circumstances — a university governed by the students, who granted to the professors little more than the status of covenanted servants. The legality of this position was certainly questionable. When these *universitates* of students claimed the rights granted to all other trade or craft gilds, it might be replied that in no other case were the apprentices suffered to form a gild apart from their masters. Neither Roman law nor Italian civic customs afforded any precedent here. The students' best appeal would be to German customary law, which granted to freemen the right of forming gilds for mutual protection; and Denifle quotes this, with several other indications in the same direction, as affording a presumption that the earliest of these Bolognese *universitates* was that of the German students. When, however, these gilds, originally founded upon a purely defensive basis, began to grow strong enough for offensive action, it was natural that their claims should arouse vehement opposition. (1) The Doctors[1] naturally led the resistance; but Pope Honorius III virtually recognized their subjection to the rectors of the scholars as early as 1224; and before the end of the thirteenth century this subjection was fully established in practice, if not in theory. (2) The citizens and magistrates of Bologna, again, though quite in sympathy with the original establishment of the student gilds, naturally resented their claim to settle disputes between themselves and the city authorities by the terrible weapon of the boycott. While no other trade gild could abandon the city without leaving their houses and goods to the mercy of their opponents, the students could at any time pack up their few books and migrate in a body to some other town. Even the greatest of medieval sovereigns found themselves powerless against these tactics; and, though the magistrates of Bologna attempted early and repeatedly to find some remedy, the popes always favored the students, who kept this weapon in their hands. The last important collision between Town and Gown took place in 1321. A scholar was executed for the abduction of a rich citizen's daughter; and the majority of the students, together with many professors, seceded by way of protest to Siena. Next year a reconciliation was effected, greatly in favor of the students. The chief magistrate of the city submitted to a public flogging, after medieval custom, in the Dominican church; and the townsfolk, at their own expense, built a chapel for the university. The statutes of 1317 gave to the university of Bologna what was practically its final form down to the end of the Middle Ages. By this time the two *Universitates* were virtually fused into one; they had common meetings and statutes, and even (it appears) one common seal. The university had now complete civil jurisdiction over its own members; but 1411 is the earliest definite date at which we know it to have had criminal jurisdiction also. A student rebellious to the rector was to be coerced by the city magistrates. The fourteen (or sixteen) Ultramontane nations elected each a *Consiliarius* (or, in a few cases, two). For this same purpose the three citramontane nations were divided into seventeen *Consiliariæ*. Many matters were therefore dealt with, not by the whole body of students, but by these counsellors in conjunction with the rector. However, "the supreme governing body was the Congregation of the two *Universitates*, *i.e.* the whole body of the students except "those who live at other men's costs . . . as for instance, the professors' assistants, the students' *repetitores*,[2] and so forth." As there were probably no common university buildings — certainly none of any size — the Congregations met in the convent of St. Dominic, and great functions such as Degree-Days were held in the cathedral. All were bound to attend the Congregation, and any might speak; but the rector had the right "of imposing silence on such as were too prolix of speech." Such Congregations, however, seem not to have met very frequently. The disciplinary statutes were not very strict, but rather such as we should expect from grown men, many of whom were dignitaries of the Church, while many more must have been scions of those families of bankers and wholesale merchants for which Lombardy was famous. Extraordinarily businesslike were the regulations for keeping the professors in bondage. This word will not seem too strong when we reflect, with Dr. Rashdall, that "while the [students] were in no way bound to obedience to the prior or college of doctors, the doctors were compelled, under pain of a ban which would have deprived them of pupils and income, to swear obedience to the student's rector. . . . While not entitled to a vote in the University Congregation, the professor was liable to 'privatio,' or expulsion from a society to whose privileges he had never been admitted." Such formal expulsion might even entail a ban upon his descendants. The professor may not leave the city without depositing a sum of money as security for his return. He is fined for unpunctuality at lecture; on the other hand, when the bell rings for tierce (9 A.M.) not only is he bound to cease, but his pupils are bound under pain of fine to rise and leave him. The doctor is fined if he skips a chapter; the textbooks are now formally marked off into roughly equal divisions, each of which the lecturer is bound to have finished by a specified date. He deposits heavy caution-money with a banker, who may return it at the year's end only to the rector, who in turn will deduct a certain sum for every day that the professor is behind his time. Moreover, if he fails to secure a minimum attendance at his lectures, the city fines him as an unprofitable servant. Equally businesslike was the regulation of the book trade in the interests of the scholars, — a code which probably inspired the similar rules at Paris and (so far as they existed) at other universities. Six university officials supervised the *stationarii*, or keepers of bookstalls, and the *correctores peciarum*, or professional correctors of Mss. No doctor or student might refuse to lend his own copy for the assistance of these correctors; and the stationers were fined for faults discovered either by the supervisor or by the purchasing scholar. Minute regulations fixed the prices for the hire of books, or the stationer's profit on the sale of a secondhand copy. There were four licensed university money lenders or pawnbrokers, with whom some professors (it must be confessed) were not ashamed illegally to compete. Colleges at Bologna were always few, and never became teaching establishments; they were simply endowed hostels for students. One of these, the College of Spain, is the only medieval specimen of any importance still existing at any Continental university, and has kept its ancient organization more faithfully than any at Oxford or Cambridge.

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[1] It must be borne in mind that the words Doctor, Professor, and Master (*qq. v.*) are synonymous in medieval university language.

[2] A *repetitor* was a tutor who, in the evening, took the students again through the points which they had

The gild of doctors at Bologna was, as Dr. Rashdall points out, probably older than the student gilds. Here, also, a distinction soon arose in practice, if not in theory, between the teaching doctors (*legentes*) and those who simply took the doctorate as a degree (*non-legentes*). The lectures were divided into *ordinary* (forenoon) and *extraordinary* (afternoon); a distinction which had at first corresponded to a difference then drawn between essential and non-essential texts. The former were reserved for doctors, but "extraordinary" lectures might be delivered by a scholar of a certain standing, who, after "admission" and the actual delivery of a course, became a "bachelor." During most of the thirteenth century, at least, it is evident that the doctor depended upon his fees, which were fixed by private contract. But the competition of other rising universities, and especially the habit of migration, naturally introduced a system of definite contracts, on the basis of guaranteed salaries and privileges. The first recorded instance of this is in 1280; a century later we find twenty-three salaried doctors of law at Bologna. Only one of these was appointed by the University itself; the real control of the teaching, in this and other Italian universities, passed more and more into the hands of an external body of governors appointed by the state, "which by the sixteenth or seventeenth century succeeded in destroying the student autonomy or reducing it to a shadow." As early as the middle of the thirteenth century, we find a strong tendency to restrict the body of teaching professors to citizens of Bologna; and this movement, assisted by the civic authorities, eventually triumphed, so far as all the better-paid posts were concerned. A similar attempt on the part of the professors to make their offices hereditary was naturally opposed by the citizens as well as by the students; but it was nevertheless largely successful. Side by side with these constitutional developments proceeded another of even greater significance. The original masters' gild had examined and promoted candidates to the doctorate as independently as any other gild of the Middle

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heard during the day's lectures. It is evident that these, like the professors' assistants, had only the status of hired servants. At Bologna, however, there were also different *repetitiones* conducted by the professors themselves in a sort of *seminarium*.

Ages. But canon law had long asserted the principle of Church control over all education; and the northern universities, in their gradual evolution from cathedral schools, naturally conceded the right of conferring degrees to that member of the chapter who had so long been *ex officio* director of education — the chancellor. Especially strong in this direction was the influence of the university of Paris, which had been growing all this time still more rapidly than Bologna. Accordingly, in 1219, Pope Honorius III made all promotions to degrees at Bologna conditional upon the consent of the archdeacon, who in that chapter ranked next to the bishop. Except for an abortive revolt in 1270, the doctors seem to have accepted this restriction without much difficulty. Bologna students were far wealthier than the average of other universities, and could well afford to pay the extra fees; while the archdeacon, content with the honor and the great addition to his income, seems to have interfered but little in the actual arrangements. But for Europe at large this bull of 1219 may almost be called epoch-making. Bologna was now brought into line with Paris: the two universities upon which almost all others were more or less directly modeled were now united in recognizing ecclesiastical control over all promotions to degrees. When, in 1292, a bull of Nicholas IV conferred on Bologna doctors the right to teach throughout the world, the university system was exalted from a local into an ecumenical institution; "the doctorate became an order of intellectual nobility, with as distinct and definite a place in the hierarchical system of medieval Christendom as the priesthood or the knighthood."

Other Faculties at Bologna. — So much for the two *universitates* of law students, and the *universitas* of law doctors; which three collectively formed what we should call by one single name, the Law University of Bologna. There were also faculties of medicine and arts; but these had no constitutional connection with the lawyers, except so far as all alike accepted their degrees from the same archdeacon. Arts and medicine formed a single university, developing later than, and imitating the organization of, the jurist schools. It is interesting to note that a statute of this artist-medical university limited the vote to those "who had attained their fourteenth year of age," thus indicating that some at least of the arts students must have been mere grammar school boys. Here also, as among the jurists, the scholars began by successfully asserting, but eventually lost, the right of electing their own professors. There was also, from 1352 onwards, a theological faculty at Bologna, but without full university privileges. (See below under the section on *Studies.*)

The Bolognese type was followed by practically all the Italian universities, by all those of Spain (though some of these latter were developed from Chapter Schools), by Cracow, Pressburg, and (according to the terms of its foundation deed, though not in actual fact), by Upsala. Let us now sketch the development of the University of Paris, a no less fruitful type. From this were derived Caen and Poitiers directly, all German universities more or less directly (Prague and Vienna being exceptions more apparent than real); and Copenhagen through Cologne or Rostock. Nearly all other medieval universities, beyond these already enumerated, show a more or less conscious fusion of the Bolognese and Paris types. In this category come nearly all those in the provinces of France.[1] The Scotch universities show the same eclectic characteristics at second hand; Dr. Rashdall shows how the practical influence in their constitution has been that of smaller French universities such as Orleans and Angers, though the founder of Glasgow plainly intended to imitate Bologna directly.

Paris and the Northern Type. — "The University [of Paris]," (writes Denifle, p. 675,) "arose on the Island, and was founded by those professors who had received from the Chancellor of Notre-Dame a testimonial of fitness to teach." It was not until the eleventh century that the schools of Paris began to attract scholars from a distance. Some of these schools were originally monastic, but probably very few could claim that title in its strictest sense. When we look closely into the evidence, it is remarkable how few *outside* pupils can be proved to have been taught by medieval monks, at least from the eleventh century onwards. Even Denifle could only point to two certain cases of abbeys which had *scholas externas*, like those of St. Gallen;[2] and his main point is unaffected by the slight overstatement which Dr. Rashdall finds in his general remarks on this subject. (D. 656 ff. R.1. 279.) Teaching very soon became a monopoly in the Middle Ages, and (like all other monopolies, even including that of justice) a probable source of profit. The chapter within its own cathedral city, the head of a monastery within his domains, the baron within his castle, the rector within his parish, all asserted this monopoly, appointed to teacherships, and naturally took fees for conferring what might prove a lucrative privilege. In spite of the emphatic prohibitions of Alexander III and church synods in the twelfth century, there are indications that the right of conferring the license to teach was still valued and vindicated for pecuniary reasons, even apart from the monopolist's natural instinct to defend a privilege for its own sake. It was almost inevitable, therefore, in the case of a town so populous and so intellectually busy as Paris, that the adjoining monasteries should sometimes harbor private-venture schools within their jurisdiction, if not within their precincts. This is illustrated by the history of Abélard, whose teaching first made Paris the real intellectual center of France. After his ejection from the mastership of the cathedral school, he crossed to the southern bank of the Seine and set up a school of his own under license of the canons of Ste-Geneviève, then a collegiate church, but destined soon to become a monastery. And Denifle rightly insists that the cathedral school pure and simple cannot claim to be the mother of the university of Paris. That institution arose from a trade-union of the various masters teaching in the Île de la Cité under license from the chancellor of the cathedral, just as Bologna arose from a trade-union of foreign scholars. And it will presently appear that the development of the university, at a very critical point, was determined by the fact that the Chancellor of Notre-Dame could not absolutely monopolize the power of conferring licenses to teach. That which he had refused might, by crossing the Seine, be obtained from the Abbot of Ste-Geneviève, who appointed a chancellor of his own for this purpose.

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[1] I here follow Rashdall: Denifle (p. 737, note 226) seems to neglect finer distinctions in asserting that "the Bolognese constitution appears as model of only two French universities, Montpellier and Perpignan: in all the rest it was the Parisian type which was dominant."

[2] Of course we here exclude the exceptional cases in which (as at Bec and St. Victor), a single monk of great reputation might attract outsiders to his theological or philosophical lectures. This might bring considerable sums to the monastery (as we know to have been the case at Bec), but it was nevertheless an infraction of the strict ideal of monastic discipline.

But at first we are mainly concerned with Notre-Dame. As the chancellor had his requirements for graduation, so had the masters their own. In this, as in other gilds, the pupil must first have gone through a sufficient apprenticeship, then obtained a verdict of efficiency from the body of masters, and finally gone through a ceremony which had probably been handed down from Roman, if not from Greek, civilization. This was the *Inceptio*, a public inaugural lecture by which the aspirant took possession of his new duties and privileges, and was at the same time formally recognized as a colleague by his seniors. This Inception became as necessary to a teacher as the chancellor's license. Before 1150, we find more and more frequent notices of students and masters at Paris, both on the Island (Notre-Dame) and on the Hill (Ste-Geneviève). In the earlier half of this century, masterships in grammar and rhetoric, as in theology, were confined to the few men who could face the ideal of study and teaching as a whole life's work. In the second half, we find bitter complaints of the multiplication of masters, their youth, and their inexperience. Here, as usual, the direct documentary evidence lags behind other indirect indications of great cumulative force; and the earliest definite graduation to which we can point is that of John de Cella, afterwards Abbot of St. Albans, who was admitted into "the fellowship of the elect masters" about the year 1175. But the young university still lacked much of the fullness of stature of an unquestioned legal corporation. About 1210 it received its first written statutes, and nearly at the same time Innocent III, by empowering it to elect a proctor at the Papal Court, granted it the right to sue and be sued at law.[1] It received fresh statutes from the Legate de Courçon in 1215; between 1219 and 1222 it obtained the right of electing officers; and in 1246, after a struggle with the papal legate, it established its right to a common seal. Before the end of the century, the rector of the faculty of arts had obtained the presidency of the whole university; and, by the middle of the fourteenth, he had become its recognized head. All these steps may be traced more or less directly to that most stimulating of causes, — the struggle against a common enemy. Though the term "Chancellor *of* Oxford" (or Cambridge) is both natural and correct, it would be more accurate to speak of the "Chancellor *at* Paris." Degrees were conferred in England by a chancellor whom the distant bishops of Lincoln and Ely allowed the masters to elect from among their own body, and who was therefore in the most real sense an official of the university. At Paris the schools had grown up under the wing of an episcopal chancellor who had existed long before the University, and who was never an *ex officio* member of the masters' corporation: his position was similar to that of governor in an English crown colony. He alone could confer the license to teach; on the other hand, the university could, and did sometimes, "boycott" any master whom the chancellor licensed against the wish of his fellow-masters. Therefore, while the university fought with the ordinary weapons of a trade-union, the bishop and the chancellor fought equally hard to suppress such "conspiracies," which threatened finally to emancipate the Parisian masters from episcopal control. The parties were fairly well matched, so that the fight resulted in constant appeals to Rome; and the popes steadily favored the cause of the future — the growing corporation of masters. Moreover, the students had the option of procuring their degrees from the Abbot of Ste-Geneviève on the south bank of the Seine; they finally vindicated their legal title to this option by an appeal to the pope in 1227; and soon we find a Chancellor of Ste-Geneviève as well as a Chancellor of Notre-Dame. By the end of the thirteenth century the victory was complete; the Chancellor of Notre-Dame was compelled to license any master sent up to him, after due examination, by the trade gild; and, though he kept much of his ancient dignity, his power was overshadowed by that of the rector. How this rector of the faculty of arts — lowest in dignity, though strongest in numbers, among the four faculties — became the virtual head of the university; and again how the faculty of arts itself was divided, in imitation of Bologna, into four nations, is too long a tale for this place; it should be sought in Rashdall, I, 319-333, and in Denifle's brief but admirable summary on pp. 131-132.

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[1] Proctor (Lat. *Procurator*) is the ordinary term for an authorized agent or representative, especially a proxy at law or a financial agent, such as a churchwarden. The chief officials of the Bolognese and Parisian "nations" were originally called proctors; so also were the heads of the Northern and Southern "nations" at Oxford and Cambridge. In process of time, they rose into the first rank of university officials; in England they attained to a sort of tribunicial power, though this was curtailed after the Reformation.

The Medieval University System. — Although the constitutional growth of Paris is perhaps even more interesting than that of Bologna, enough has been said already to emphasize the main point, that the medieval university system was not created, but evolved. It grew out of the remarkable renaissance in learning and art which characterized the eleventh and twelfth centuries; it was synchronous with the general decay among monastic institutions, and the remarkable efforts of Bernard, Francis, and Domini to institute a durable reform. It may be called a lay movement in the same modified sense in which that adjective has been applied to the artistic renaissance to which we owe the greatest cathedrals. The germs of both had been sheltered in the cloister; to the last, the Church claimed and exercised great influence over both art and learning; yet both movements were in themselves as spontaneous and irresistible as is that passion for physical science which has transformed modern Europe. It is astonishing how little was done directly, either by Church or by State, to foster these learned corporations. By far the stronger impulse seems to have come from below; the highest authorities contributed little beyond a regulating and guiding force. No country had so many medieval universities as Italy, and in none was civic life so strong; the Italian universities, almost without exception, grew out of town schools and owed most of their encouragement to the civic authorities. Of the fourteen universities existing before the end of the thirteenth century, only three owed their foundation to emperors or kings (Palencia 1212, Naples 1224, Salamanca 1243); and two to popes (Toulouse 1229, Papal Court 1244).[1] The movement was still so new, and popes or sovereigns were still so far from a definitely formulated policy with regard to it, that universities were allowed to grow up in their own independent fashion, and at last were recognized as existing *de facto* or *ex consuetudine*, when the lawyers began to formulate scientific definitions on behalf of pope or emperor. From about the year 1300 onwards, these legal theories were cut and dried; thenceforth it was recognized as a general rule that popes or emperors alone had the right of creating universities in the fullest sense, and that no new foundation could be valid without their charter. And the deciding factor — the consideration which gradually rendered the policy of drift more and more impossible, and imperatively demanded some clear definition — was the question of the validity of degrees. In 1219, Honorius III had issued a decretal which doubly affected this question. The metropolitans were bidden to send capable subjects away from home for the study of theology, in order that these themselves might become teachers on their return; and this absence for study's sake was to be counted meanwhile (up to a limit of five years) as a legitimate and unimpeachable excuse for non-residence. This made it more and more necessary to define what schools were of sufficient note to come under the terms of the decree; especially since, in process of time, diocesans also granted licenses of non-residence for study to their parish clergy. Nobody doubted that the Paris mastership, or study at Paris, were sufficient vouchers for a student who wished to prove his qualifications as a teacher, or to give a sufficient excuse for non-residence. But there were many other schools, with regard to which the gravest doubts might arise; hence the smaller universities secured themselves by procuring formal charters, which should grant the *jus ubique docendi* — *i.e.* the universal recognition of the degrees they conferred. This led to the feeling that such a charter (which of course could be conferred only by pope or emperor, spiritual or temporal world-sovereign) was of the essence of a true university. In 1292, therefore, even Bologna and Paris fortified themselves by obtaining formal grants of this right from the pope. It would be quite wrong, however, to suppose that lawyers' theories or papal bulls finally settled the matter. There was much characteristic looseness of definition on the subject all through the Middle Ages; nor could the pope himself secure anything like absolute respect for the *jus ubique docendi*. Neither Paris nor Oxford would admit each other's doctors without fresh examination; and even much less important universities excluded outsiders by what was practically, if not technically, an infringement of papal decrees. Yet it was pretty universally recognized in theory, from the end of the thirteenth century onwards, that only pope or emperor could henceforth confer world-wide university privileges in their completest sense. There were many schools, however, especially in Spain, which were founded by the sovereign without papal or imperial charter; and these were allowed to be *studia generalia respectu regni*. The king or prince, that is, had a recognized right to confer the *jus ubique docendi* within the limits of his own dominions. But, to acquire a world-wide force, the privilege must be confirmed by a higher power; and so in fact we find that it was, in the large majority of cases in which the *studium generale respectu regni* grew to maturity. Denifle, who goes only down to the year 1400, reckons eleven universities without charters of foundation,[1] sixteen with charters from the pope,[2] ten founded by emperors or other temporal rulers (including republics),[3] and nine of a mixed character, with charters both from popes and from temporal rulers.[4] In addition to these, there were nine which were solemnly founded, but stillborn.[5] From this date until the end of the Middle Ages two more were founded in Italy; six in Spain; eight in France; ten in Germany; three in Scotland; one each in Hungary, the Low Countries, Denmark, and Sweden. This gives us a total of seventy-nine living universities founded before 1501; but Rashdall, with some hesitation, would rule out two from the list — Modena and Seville.

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[1] I here count Arezzo, which became extinct and was re-founded in the fourteenth century; also Montpellier and Cambridge, which Denifle also counts with reservations. But Denifle's attitude towards Cambridge, which he would date as an unquestioned university only from the papal bull of 1318, is difficult to understand. As Rashdall points out, it was at least a university *respectu regni* from the middle of the thirteenth century onwards. The first German university (Cologne, 1347) had thirty predecessors in other countries; but it must be remembered that the German nation had always been very strongly represented at Paris, Bologna, and elsewhere.

It has been hotly argued on one side that we are to look upon the universities as thoroughly ecclesiastical institutions; and, on the other, that they mark in fact a victory of the lay spirit over ecclesiasticism. The truth (as we have already indicated) may be found within these two extremes. The university movement grew up within the church, and was outwardly controlled by the church; but, by its very presence as a new and living organism, it did much to break up that narrow conception of the church which was so often taken for granted in the later Middle Ages — a conception which would almost have identified the words *ecclesiastical* and *clerical*. Paulsen sums up admirably, from both points of view, in the first chapter of his *German Universities* (tr. Thilly and Elwang, pp. 26–28). The universities were self-governing institutions, and often (in Germany always) founded by the state. But the church never ceased to assert her legal monopoly of teaching, never ceased to patronize the schools, threw the ægis of her immunities over the students, paid the teachers with benefices, and prescribed the clerical dress and form of life for both masters and pupils, the enormous majority of whom looked forward to becoming clerics in a more special sense. On the other hand, all this was less definitely clerical than the old monastic or cathedral school education; the mere fact that princes and municipalities undertook the burden of foundation shows the reality of lay influence; and, though the church gladly accepted the new schools, these were necessarily destined to spread a new spirit. "There can be no doubt that the medieval universities prepared the way for that great emancipation of subjective reason which occurred during the Renaissance and Reformation, even though their attitude was hostile in many respects to both these movements."

Studies. — These points will come out still more clearly if we consider the origins and growth of university teaching; and perhaps the briefest method of bringing out these characteristics will be to compare the great minds of the first university generations with their immediate predecessors — Aquinas and Bonaventura with Bernard, Abélard, and John of Salisbury. There is much in John of Salisbury which makes us regret that the humanism of the twelfth century was so soon overwhelmed by the rising tide of academic organization; but it makes us feel at the same time how much stronger was the new movement than that which it overflowed and swept away. The school of Chartres (*q.v.*) was humanistic in a very real sense: John's description of his teachers' methods reveals a steady determination to master both the style and the contents of such classics as had come down to the twelfth century. But the time was not ripe for an Academy or a Porch after the classical pattern. Here and there, a group of real scholars might pace the terraces of the bishop's palace in some great cathedral city, and mold a small band of pupils to the daily discussion of the deepest problems of this life and hereafter; yet even these could not move quite freely among the heavy trammels of thought and circumstance which clogged that iron age. Such classical schools as those of Chartres and Orleans must necessarily have remained few in number, unfrequented, and restricted in their action. Europe needed some intermediate phase between the intellectual anarchy of the Dark Ages and the coming freedom of the Renaissance; and the early universities did for the realm of intellect something of the work which was done in politics by the feudal system. St. Bernard exemplifies admirably both sides of that earlier classical revival which shaped his boyhood and his youth. It was powerless to satisfy him in the end; the world's life needed simpler thoughts and more direct methods than those which appealed to the school of Chartres. His style owes enormously to the classics, but in thought he repudiates them, seeking to become again a man of one book — the Bible. The crying need of the century was rather for a popularization than for an intensification of knowledge; no higher thought could be permanently vital until the simpler elements of culture had been spread abroad; there must be some approach to the democratic literary basis of Athens before the aristocracy of intellect could again strike out in its own line. This work of popularization was done by the universities, especially when the friars came upon the scene; and with popularity there came (perhaps by a necessary implication) some tinge of vulgarity also. The effects of the rediscovery of Aristotle's complete works, in the early thirteenth century, may in some ways be compared with the impulse given to science by the startling discoveries of the nineteenth. With the new Aristotle in their hands, men could complete the revolution begun by Abélard, who has better claims than any other to have founded scholasticism (*q.v.*) in the usual sense of the word, *i.e.* scholastic theology, as distinguished from the scholastic philosophy which had been an earlier product of the Middle Ages.[1] This revolution was not altogether silent or peaceful. At first, Aristotelianism was almost as abhorrent to the older humanistic school as Darwinism to the nineteenth century; but the new scholasticism had all the elements of popular, as well as of a deeper, success. While the higher minds found their full satisfaction in Aristotle and the Bible, ordinary men found it far easier to practice dialectics for a few years upon these texts, conventionally regarded as unimpeachable, than to pursue truth at leisure, without haste or rest, through all her elusive tints and shadows. Scholasticism promised far more immediate and more tangible intellectual conquests than the older humanistic culture. Moreover, the practice of the schools held out an equal overbalance of advantages for professional life. Besides its utility for the higher clergy, it formed an admirable introduction to the lucrative pursuits of civil and canon law, and even of medicine, as then practiced and understood. It fostered verbal memory and readiness of speech to an extent which has never been rivaled by any later system of education. Through these natural channels the boisterous flood of the twelfth century Renaissance was easily diverted over all Europe; but it lost in force as it gained in diffusion. Abélard's passion, brilliancy, and originality drew crowds of auditors even into the desert with him; men gave up their homes, their civilization, to follow him in the way of intellectual salvation, even though this led to conflict with established authority. Aquinas, on the other hand, ran all through life in harness. He came as a boy into a learned society whose traditions were already strongly established; in accordance with those traditions, he set himself from the first to build up from the Bible and Aristotle a complete and harmonious theory of life; yet his contemporary, Roger Bacon, could see as clearly as we see that even the popular success of such a work must involve its scientific failure, and Aquinas himself, in his last years, was keenly conscious of more than superficial imperfections in his writings. Abélard, in 1100, was crippled by the sparseness of philosophical culture around him; in 1250, Aquinas was unable wholly to extricate himself from the popular tendencies of the Parisian republic of letters. Men like Bacon, who persisted in their comparatively independent attitude, were doomed to neglect and oblivion; and (as Dr. Rashdall has recently pointed out) much of the most original thought of the Middle Ages was probably strangled by the very universities which had given it birth.[1]

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[1] Paris, Bologna, Salerno, Oxford, Orleans, Angers, Padua, Vercelli, Reggio, Modena, and Vicenza. To these we should add Cambridge, and perhaps Montpellier, which Denifle puts into the next category.

[2] The Roman Court, Rome (two distinct universities), Pisa, Ferrara, Toulouse [Montpellier], Avignon, Cahors, Grenoble [Cambridge], Valladolid, Heidelberg, Cologne, Erfurt, Fünfkirchen, and Ofen.

[3] Arezzo, Siena, Naples, Treviso, Orange, Palencia, Salamanca, Seville, Lerida, and Huesca.

[4] Perpignan, Lisbon (or Coimbra), Perugia, Florence, Piacenza, Pavia, Prague, Vienna, and Cracow.

[5] Fermo, Verona, Orvieto, Pamiers, Dublin, Valencia, Alcalá, Geneva, and Lucca.

At the same time, it must be obvious that the general civilizing influence of such a republic of letters was immense. The learned J-V. Le Clerc expresses this in terms which may be somewhat highly colored by patriotism, but are at bottom as true as they are impressive.[2] He exaggerates the equality between rich and poor; yet it is true that within the university precincts, as within the church walls, there was far less inequality than in any other phase of medieval life. The Collège de Boissy, founded in 1356 at Paris by a canon of Laon, provided primarily, as usual, for scholars of the founder's family: "but, if there be none such, then let them be chosen from the village of Boissy or hard by, provided only that they be not of noble birth, but low-born and poor, as we and our forefathers were." The college was, it is true, soon absorbed by a richer foundation, and Dr. Rashdall publishes a strange story of its inner life (I, 504); but, though not very many of the really poor found their way to the medieval colleges, many such went to the universities; and poverty often constituted a recognized claim upon public charity. In the rolls of deserving names sent annually to the pope for benefices, it became finally a recognized tradition that, *cæteris paribus*, poverty should give precedence. A society of this sort would naturally beget and discuss many social and political theories which were never seriously transferred to practice until the French Revolution, yet which did not remain entirely barren even in their own time. Dr. Rashdall (Vol. I, pp. 518 ff.) has admirably described the part played by the university in European history. He shows it not only as one of the preponderating forces in French politics, but also as one of the Great Powers of Europe. It was mainly responsible for the comparative mildness of the Inquisition in Northern France; it took upon its shoulders "the theological police of the church" at large, and even forced the hand of John XXII on an important matter of doctrine. The great councils which form one of the most important factors in fifteenth century history were mainly due to the action of the university; and such reforms as were actually carried out at Constance were secured by the Parisian system of voting by "nations" instead of by heads. Lastly, it is to the influence of the university that we may trace much of that "ineradicable Catholicism of Paris" which turned the scale against the Reformation in France.

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[1] Scholasticism may be defined as a synthesis of philosophical, Biblical, and patristic texts, by the *scholastic* method, *i.e.* the method naturally developed in *schools*, where books were rare and dialectical discussion was facilitated by the comparative smallness of the audience. John the Scot had already attempted a similar synthesis, but by non-scholastic methods; others had applied the dialectical methods to philosophy, but not yet to theology. All attempts to define scholasticism by its subject matter or its final aim, rather than by its methods, must not only ignore the etymological evidence but are apt to beg questions which had better be left open. Maurice De Wulf, in his valuable *History of Medieval Philosophy*, is thus driven to make "*scholastic*" practically synonymous with "*ecclesiastically orthodox*."

[1] *Proc. Aristotelian. Soc.* 1907. Nicholas d'Autricourt in 1340 anticipated much of the most characteristic teaching of Berkeley and Hume, but we know this only by chance, through a list of his condemned propositions.

[2] *Hist. Litt. de la France.* État des Lettres au XIV Siècle. I^{re} Partie II. 5.

But we must describe the medieval studies in closer detail. The hours of work began earlier, but their aggregate was much the same as in the case of the steady student of to-day. Lectures, with a few negligible exceptions, were in Latin, and it was assumed that the student came up with enough grammatical training to understand them; but there are indications that a good many fell below this requirement. There were therefore grammar schools even at the universities; the founder of Merton College at Oxford added a Master of Grammar to his college staff; for magnificent later foundations such as New College at Oxford or King's at Cambridge, the founders established separate grammar schools at Winchester and Eton. (See under COLLEGE.) We may take the studies of Paris as a type of the rest, and especially the arts course, which was followed by the overwhelming majority of the students. This course included the so-called *Trivium* (grammar, rhetoric, and dialectic [*i.e.* logic]), and *Quadrivium* (music, arithmetic, geometry, astronomy), though the four latter items were never taken very seriously, and by far the most important subject was the Aristotelian philosophy — hence the ordinary German term of *Philosophiæ Doctor* for Master of Arts. (See LIBERAL ARTS.) Lectures were given *ordinarie* and *cursorie* (at Bologna, *ordinarie* and *extraordinarie*). These terms originally rested upon a distinction of subject matter according to its primary or secondary importance; but this naturally grew into a distinction of method also. The description of Odofredus (*c.* 1250), though referring immediately to a law text, gives a good idea of the minuteness with which an "ordinary" lecturer was expected to expound Aristotle also. "First, I shall give you summaries of each title before I proceed to the text; secondly, I shall give you as clear and explicit a statement as I can of the purport of each law [included in the title]; thirdly, I shall read the text with a view to correcting it; fourthly, I shall briefly repeat the contents of the law; fifthly, I shall solve apparent contradictions, adding any general principles of law . . . and any distinctions or subtle and useful problems arising out of the law, with their solutions, as far as the Divine Providence shall enable me. And if any law shall seem deserving, by reason of its celebrity or difficulty, of a repetition, I shall reserve it for an evening repetition."

It is probable that in the universities, as in other gilds, seven years of preparation were originally required for the mastership. But at the end of the thirteenth century Paris required only "five or six years of study"; this had been reduced before 1400 to four and one half years, and the Chancellor of Ste-Geneviève was even content with three, which he interpreted as "two complete years and part of a third," though perhaps this assumed previous study at some other university. About midway in this course, the student became a *baccalaureus* (*q.v.*), passing thus (in the language of other gilds) from the state of apprentice to that of journeyman. This ceremony was called *determination*, because the candidate showed his capacity by leading off, and finally pronouncing judgment upon, the formal discussion of some thesis. From this time forward the student might give cursory lectures himself, while continuing to study under his masters. Oxford always adhered, nominally at least, to the minimum of four years before determination, with three years more before *inception*, a term which indicated how, having proved his capacity and experience, the student might at last begin to teach as a master.[1]

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[1] At Cambridge, the bachelor was said to *incept* and the master to *commence*. The above-stated facts explain the modern Oxford and Cambridge degree course of three to four years. The bachelorhood has become the real degree, the mastership having sunk into a mere question of seniority and payment of fees.

For the mastership in theology, law, or medicine some eight or ten years of further study were needed. If this sounds an extremely high standard, we must remember the laxity of practice which, throughout medieval life, contrasts so sharply with theory. The records, as Dr. Rashdall points out, make it abundantly evident that at least 50 per cent of arts students never proceeded even to the B.A. degree. For those who did, the ordeal was less severe than it seems at first sight. Favor, bribery, and intimidation, which played so great a part elsewhere in medieval life, soon found their way into the universities: but Dr. Rashdall warns us against exaggerating the evidence on this head (I, 460). "On the whole it may be inferred that a student who was notoriously ignorant of the merest elements of Latin or logic would scarcely have found a master to present him for a degree; and the examinations, as may be presumed from the length of time which they occupied, were considerably less of a farce than the pass examinations of Oxford and Cambridge have been almost within the memory of persons now living. It is clear, however, that there were degrees of laxity in the different universities and at different times, though complaints of extreme laxity are universal, especially in the fifteenth century."

A further question is that of the *intrinsic* value of medieval university studies. It is evident at first sight how much justification there was for Roger Bacon's criticism of Aquinas and his fellow schoolmen — that their system, with all its elaboration and show of completeness, rested upon Biblical and Aristotelian texts not seldom corrupt or misunderstood; and that it neglected the mathematical and physical sciences almost altogether. But here again we must beware of exaggeration. It is easy to underestimate even the present-day value of scholastic theology; in some respects, Aquinas still remains the most valuable of existing commentaries upon Aristotle. Moreover, the present-day value of a philosophical system is an untrustworthy measure of its original value; if scholasticism is superannuated, so also are other past philosophies which had real elements of greatness. The greater part of our modern philosophical phraseology was elaborated in the Middle Ages. And, although it has been truly said that the usual medieval idea of knowledge was to know what some predecessor had said or written, yet this limitation followed naturally from other more general limitations of medieval civilization; nor can it justly be charged to the universities in particular. The few cannot immediately share their mental conquests with the many, especially when the many have such an institution as the Inquisition on their side. The higher philosophical minds showed great originality within their necessary limitations, and (as we have seen in the case of Nicholas de Altricuria) sometimes even outside. There was far more conscious or unconscious skepticism in the medieval schools than is usually suspected; and, in individual cases, a deeper pursuit of the exact sciences. Although medicine was theoretically in bondage to Aristotle and the Greek medical writers, yet actual dissection was practiced in Italy and Southern France, where the clergy were more tolerant or less powerful. There were surgical writers in thirteenth-century Bologna whose works were printed and reprinted until the middle of the sixteenth century. The Italians had really distinguished mathematicians and astronomers at an equally early date; but even their contemporaries seem to have known little of them. No university can rise much higher than the population by which it is fed.

The Renaissance. — While the medieval universities steadily lost in scientific originality, they gradually leavened the people. Scholastic philosophy had run its course before Henry VIII's Visitors pillaged the Oxford libraries and "utterly banished [Duns Scotus] from Oxford for ever." But there is strong evidence that university discipline was better and that the schools afforded a better education for the ordinary man, though far less stimulus for the student of real originality, than in earlier centuries. Fifteenth-century Latin is, as Paulsen justly points out, a more real language, and in many respects more truly literary, than the would-be classical Latin of the Renaissance. Meanwhile, however, new ideas filtered in, mainly from Italy. Cardinal Nicholas of Cusa (*d.* 1464), who may be taken as one of the last of the schoolmen, was also a scientist and political reformer of very great originality, an anticipator of much that is most characteristic in modern culture. The beginnings of the Renaissance were mainly independent of the universities; the earliest humanists were naturally often promoted to professorships, but chiefly by the favor of great men. Humanism was the intellectual side of the growing wealth and luxury of society. It grew up first in Italy, where scholasticism had never really flourished; it invaded Germany and England only with the rapid increase of trade which marked the latter part of the fourteenth century. In this, again, it may be compared to the scientific revolution in modern studies. The new popularization of the classical historians, rhetoricians, and poets appealed to princes and magistrates who had never cared for the school philosophy. In the earlier decades of the sixteenth century, the humanists had not only conquered in public opinion, but had compelled the university authorities to make formal and sweeping changes in their curricula. Paulsen quotes, as a visible sign of this change, the sudden and total disappearance of Alexander de Villa Dei's *Doctrinale*, which had been the consecrated Latin grammar of the last three medieval centuries. Up to 1520 it was still in constant use and print; then, within a few years, we lose sight of it altogether. Quite apart from the Reformation, scholasticism would naturally have fallen into the background, though to some extent it would still have survived the intellectual revolution, as indeed it has survived even now, in response to a real, though limited, need of the human mind. The bitter conflict between old and new in study and religion, the Renaissance and Reformation, concerns us here only as they affected the ancient seats of learning. Their influence was at first disadvantageous; every quarrel marks, in itself, a loss of ground. The Reformation, especially, affected most injuriously both the attendance and the studies at many universities. Not only did these disputes render the student's outer life more uncomfortable and precarious, but the din of theological strife too often drowned the voice of sober reason; men had neither time nor patience to listen to any truth which did not directly affect the burning questions of the moment. In England, for instance, Oxford graduations show a marked decrease in the latter years of Henry VIII, and fell lower still under Edward VI. Under Mary, they rose again; but at more Protestant Cambridge they here reached their lowest level. The Elizabethan settlement, however, produced the expected improvement; even at Oxford the number of students doubled during her reign. At Cambridge only 28 B.A. degrees had been conferred in 1558; by 1570 the number had risen to 114, and by 1583 to 277. During the seventeenth century the universities probably exercised a stronger and more beneficial influence upon English life than at any time since the thirteenth and fourteenth centuries.[1] Moreover, the need of extension was already felt. In 1640, influential petitions came to Parliament for the foundation of a new university at Manchester or York: but in a few months the Civil War had broken out. In 1647 it was proposed to found one in London; and ten years later, Cromwell attempted to found one at Durham, but was thwarted by the jealous opposition of Oxford and Cambridge. But abroad, and especially in Germany, the wars of religion produced more permanent effects. Ten new Protestant universities were founded in German-speaking lands between 1527 and 1665, of which five still remain. The Roman Catholics founded eleven, from 1549 to 1702, though some of these were never full-fledged universities, but rather theological schools under Jesuit control; four of them still survive. The reasons for this comparatively low vitality are sufficiently obvious. The new universities were all founded by secular princes or prince-bishops, from three main motives of home policy — to insure instruction in the religion of the particular state, to train future state officials in its political traditions, and to keep money from being spent abroad. This, as Paulsen points out, was a real limitation of the cosmopolitan spirit which had animated the medieval universities; especially since the Protestant theological teachers were, if anything, more definitely limited by outside authority than the Roman Catholic; for their dogmatic position was less secure, and they had enemies on both sides — the extreme right and the extreme left. But the contrast is not quite so great as Paulsen supposes: not only was Naples, with many Spanish and German universities in the Middle Ages, founded for preponderantly territorial reasons, but also the medieval popes, in limiting the study of theology to a minority of universities, had been much influenced by narrow considerations of church politics. (Denifle, 704 ff.; Rashdall, I. 251 ff.) Still, Paulsen is doubtless correct on the whole when he writes of German universities " we are less in touch with the period between the middle of the sixteenth and the beginning of the seventeenth centuries than with any other in the entire history of our nation."

The Roman Catholic universities, however, fared still worse. While those of Spain were too little touched by the new spirit to keep pace with the requirements of the times, those of France and Italy were rapidly superseded even in the stock subjects of the medieval period — theology and philosophy. In Protestant countries, the determination to put all the clergy through a university course did indirectly encourage philosophy as well as theology, and kept the universities somewhere near the highest speculative level of the time. But the Counter-Reformation, while laying equal stress on the education of the Catholic clergy, aimed at this result by different methods: episcopal seminaries were erected for the professional education of the clergy, and even the great school of Paris rapidly shrank to a shadow of its former self: "it may be said that the French universities no longer existed, when they were abolished at the Revolution" (see FRANCE, EDUCATION IN, *ad init.*). On the other hand, the philosophy even of Protestant countries was still deeply tinged with scholasticism down to the middle of the seventeenth century (cf. Mullinger, *Hist. Univ. Camb.* III, 135, 373, 419, 435, 449–451). But, by this time, newer studies were already beginning to flourish. A chair of history was founded at Cambridge in 1628, mainly at Francis Bacon's suggestion; and, though the lecturer's discourses on Tacitus were thought "so applicable to the exasperations of these villainous times" that they came to a premature conclusion — though John Hall in 1649 complains bitterly of the absence of serious historical, chemical, or anatomical teaching — yet the very complaint indicates what public opinion was beginning to expect of the universities. Leibnitz's efforts to found rival academies in Germany, and the example set by the Royal Society in England, gave a powerful stimulus to the older institutions. (See SCIENTIFIC SOCIETIES.) Halle was founded in 1694 on the principle of *libertas philosophandi*. Aristotle and the Bible were no longer treated as too sacred for critical discussion, and the same spirit was spreading in many other places. Whichcote, Provost of King's from 1644 to 1660, could write from Cambridge, "there is nothing more unnatural to religion than contentions about it"; and again: "Truth is truth, whosoever hath spoken it. . . . If this liberty be not allowed to the University, wherefore do we study? We have nothing to do but to get good memories, and to learn by heart." Already the best Oxford and Cambridge students were accepting the Copernican astronomy; and in 1669 Newton began his thirty-three years' tenure of the newly founded chair of mathematics at Cambridge. In the first years of the next century, Christian Wolff was teaching at Halle that all sound philosophy must be based, not on theology, but on the exact sciences. His banishment by Frederick William I and his restoration by Frederick the Great marks the victory of rationalism in the Protestant universities of north Germany; and, before the close of the century, the Catholic south was following in the same direction.

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[1] Dr. Venn writes of Cambridge, "Absolutely — not relatively merely — the number of graduates in the years about 1625–1630 was greater than was ever attained again till within living memory." *See* Mullinger, III, ix.

The Modern Period. — It is needless to trace here the further growth of the modern spirit, or to follow the university development throughout Europe; this can be sought under the headings of the different countries. But one word must be said concerning the remarkable movement of the last century in Germany.

One natural characteristic of universities in general has been a reasonable — sometimes even an unreasonable — conservatism. Denifle (754 ff.) has some illuminating pages about the anomalies created in medieval instruction by the simple fact that all succeeding foundations modeled themselves upon the traditions, sometimes purely local and temporal, of Paris or Bologna. Even in countries like England, which had their own body of written national jurisprudence, the universities knew no legal studies but in Roman civil and canon law. The neglect of classics at Paris did much to kill the humanistic studies which had been so flourishing at Chartres and Orleans in the first half of the twelfth century; and the scholastic theology of Paris, with endless dialectical disputations upon the *Sentences*,[1] killed all systematic study of the Fathers (and to a great extent, it may be added, of the Bible). Only medicine, at Salerno, Montpellier (and again we may add Bologna), ran a really independent course. Denifle seems here hardly to allow enough for the spirit of the times, which (as we have pointed out above) was decidedly unfavorable to the careful study of classical literature, and correspondingly favorable to the growth of scholasticism. But it seems clear that, with the small exception which he makes for medicine, no study flourished in the Middle Ages which we cannot find in full swing at Paris or Bologna in the early years of the thirteenth century. The Council of Vienne (1312) ordered that chairs of Greek, Arabic, Chaldee, and Hebrew should be established at five European universities; yet there are only the slenderest traces of actual teaching in these subjects, and these only at Paris and Oxford. Alfonso the Wise established a university at Seville for the study of Latin and Arabic, his express objects being both commercial and missionary. The foundation was ratified by Papal bull in 1260; but there is no evidence that the school ever existed except on paper. Only here and there again, has a great movement originated at a university, as Wycliffism at Oxford, the Conciliar movement at Paris, and again the Anglican Revival at Oxford. The permanent teaching staff of a university tends to form a sort of intellectual second chamber, whose main business it is to hand down the torch from its forefathers, and to admit no innovations which have not already been approved by experience. In England, the new spirit has been championed mainly by new universities: London [1826]; Durham [1832], with its scientific college at Newcastle; Manchester, [1877]; Liverpool [1881]; Birmingham [1900]; Leeds [1904]; Sheffield [1905] (*qq.v.*). But the modern spirit found its way far earlier to the universities of Germany and thence in many ways influenced foreign countries. It is one of the ironies of history that the French Revolution, while reconstituting university organization, left the teaching essentially unaltered; and that monarchical and vanquished Prussia undertook the boldest and most fertile educational experiment which had been seen since the Reformation, or perhaps since the close of the twelfth century. After the disaster of Jena, she set herself deliberately to a national reorganization, by universal military service on the one hand and a new educational system on the other. The University of Berlin was at once founded to make up for the loss of Halle by the Treaty of Tilsit; and it was endowed with a liberality which contrasted with the impoverishment of the country. "The state," said the King on this occasion, "must replace by intellectual forces the physical forces which it has lost." The same movement involved the reform of the older universities and the creation of a whole new system of secondary education. Under the special direction of W. v. Humboldt, something more than the "freedom of teaching and learning" of Halle was now aimed at. The German universities of the eighteenth century, much as they did for national life, were still too content with the rôle of providing clerical and secular officials for the state; their primary business was not to discover, but to impart the traditional knowledge. Napoleon's reorganization of the French universities had kept the same object in view; they became "professional state schools with hard and fast instruction and without the scientific spirit"; the real intellectual work of France was done by the Academy. Germany, on the other hand, has aimed at introducing into the Republic of Intellect the root principle of Plato's *Republic*, that the Philosopher shall be the Ruler. Professors are not only teachers, but independent scientific investigators; the acquisition of fresh knowledge is as essential a part of their duty as the imparting of what they already know. Equally important is a third factor, the stimulus to original research on the part of their students; so that professor and pupil are conceived as copartners in the great business of truth-seeking. At no time or place, since the fourteenth century at any rate, has so overwhelming a proportion of national talent been absorbed by the universities as in modern Germany — for the other states have followed Prussia's example. At no time or place have the universities done more to interpenetrate the whole national life. Of course, the very perfection of such a system has its dangers; where it is expected that every man worth hearing should be a professor, men of unusual originality may fail here and there to command the attention which they deserve. But the movement is none the less one of the most remarkable in the history of civilization, and is probably destined to influence foreign countries even more in the future than in the past. G. G. C.

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[1] *i.e.* Texts extracted from Biblical and patristic writings, and arranged under different heads for purposes of comparison and antithesis; a method inaugurated by Abélard in his *Sic et Non*. The classical collection of "Sentences" was that of Abélard's pupil, Peter Lombard.

See also College; Cambridge University: Degrees; License; Master; Middle Ages, Education in; Oxford University; Renaissance, Education in; Scholasticism; Student Life; Universities, American Endowed; Universities, American State; the sections on universities in the articles on the various National Systems; and the separate articles on various universities; *e.g.* Berlin, Leipzig, etc. Further references will be found under each of these.

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UNIVERSITIES, AMERICAN ENDOWED. — General Characteristics. — The classification of the American universities into the two categories of state and endowed is not altogether satisfactory since it is based upon a mere difference in financial support and does not mark a clear line of separation. The terms used instead by the United States Commissioner of Education "public" and "private" are no better, for it sounds absurd to call a famous institution with thousands of students from all over the world a "private university" and a small and obscure institution with practically all its students drawn from a single state a "public university." The classification is, however, a convenient way of distinguishing two types of universities, of somewhat different characteristics resulting in part from the fact that one type derives its income mostly from invested funds, gifts, and the student fees, and is not under the control of state or municipal authorities, while the other type is mostly supported by state appropriations and is under the management of trustees appointed by the governor or elected by the voters. It is a curious fact that many of the older endowed universities now almost completely independent were state institutions in their early days and that many of the older state universities are the outgrowth of private denominational colleges. Such leading and typical endowed universities as Harvard, Yale, Columbia, Pennsylvania, and Princeton were in the eighteenth century under the control of and partly supported by the state. Until 1865 the Overseers of Harvard to whom the Corporation was responsible were elected by the state legislature. Many of the endowed universities have the governor of the state or other officers as *ex officio* members of their governing boards. In Pennsylvania the governor is president of the board of trustees of the university.

Appropriations from the state to an endowed university for special purposes are not uncommon, and sometimes departments are established or maintained by the state. For example, the University of Pennsylvania received from the state $280,000 toward the erection of a building for the School of Veterinary Medicine. In Cornell the Agricultural College and Veterinary College are supported by the state of New York and the agricultural experiment station of that university receives federal aid. On the other hand the state universities usually charge some fees, say from $10 to $50 a year, possess some invested funds and often receive benefactions of books, collections, or money for expeditions, prizes, or scholarships. The University of California has been more favored in this respect than any other state university, as it has received in gifts and benefactions $8,500,000, about half of which has been spent for buildings.

Income. — Taking the colleges, universities, and higher technological schools of the United States as a whole, the income from endowment is approximately the same as that received from states and municipalities, though the latter in recent years is increasing more rapidly than the former. Other sources of income such as tuition fees amount to somewhat more, and this of course goes mostly to the endowed institutions. According to the report of the United States Commissioner of Education the income of the higher educational institutions of the country for the year ending June, 1911, amounted to $46,493,809 and was derived from the following sources: state and municipal appropriations $14,707,243; income from invested funds $13,293,446; income from fees for tuition and other educational services $18,493,120. The universities, colleges, and technological schools of the United States received during the year 1910–1911 gifts and bequests amounting to $22,963,145, which was an increase of $4,226,006 over the benefactions of the year before. (See PHILANTHROPY, EDUCATIONAL.) State, federal, and municipal grants are not included. Of this amount $5,723,536 went for increase of plant, $3,469,739 for current expenses, and $13,769,870 for endowment. Twenty-five endowed universities report the receipt of gifts and bequests during the year amounting to over $100,000 apiece; the total aggregate of these is $11,941,803. The only state universities receiving over $100,000 in gifts and bequests during the year were Michigan ($231,612) and California ($104,889). The benefactions received by schools of theology for the same year amounted to $1,552,964; schools of law $76,777; schools of medicine $955,718. American institutions for higher education have been treated with unprecedented liberality in recent years, as is shown by the fact that the gifts and bequests to universities, colleges, professional and normal schools, and private academies from 1871 to 1911 amounted to $493,347,496. For the last ten years the sum of such benefactions has averaged over $25,000,000 a year. The confidence of the American people as a whole in higher education is evinced by their still more generous support of state and municipal institutions by voluntary taxation. (See MUNICIPAL COLLEGES AND UNIVERSITIES.) Indirectly the endowed universities are aided by the state, in that they are like religious and charitable institutions, freed, in part at least, from taxation. In some states this exemption applies only to the land and buildings actually used for educational purposes and not to real estate held for an investment or to other revenue-producing property. There has been much discussion of the propriety of this exemption in such doubtful cases as dormitories or professors' houses belonging to the university.

Attendance. — It is impossible to state how many endowed universities there are in the United States, because no absolute line can be drawn between university and college in American usage of these terms. The Association of American Universities, "composed of institutions on the North American continent engaged in giving advanced or graduate instruction," was organized in 1900 by fourteen institutions and has been quite conservative in admitting others, so that its membership may be assumed to comprise the leading universities of the country. The list of members in 1910 included the following endowed universities: Yale, Princeton, Pennsylvania, Leland Stanford Junior, Johns Hopkins, Harvard, Cornell, Columbia, Clark, Chicago, and the Catholic University of America, together with the state universities of Wisconsin, Virginia, Nebraska, Missouri, Minnesota, Michigan, Kansas, Iowa, Indiana, Illinois, and California. Degrees from these universities are accepted in Germany without question and credit is accorded for graduate work done in them.

In its ordinary signification, however, the term "endowed university" would include a much larger number of institutions. If we adopt for convenience an arbitrary lower limit and call all those institutions "universities" which report more than twenty graduate students in residence, we find in the *Report* of the United States Commissioner of Education for 1911 that there were thirty-eight endowed universities, of which eight were for men, two for women, and twenty-eight provided instruction in some form for both sexes. The total number of students in these institutions was 67,879 (50,200 men, 17,679 women), which includes 5313 male graduate students and 2087 female graduate students, and 14,385 male professional students and 555 female professional students. The instructors numbered 6826 men and 578 women. According to this definition the endowed universities of the United States comprise 73 per cent of the graduate students, 40 per cent of the professional students, and 22 per cent of the total number of students receiving higher education. In the first decade of the twentieth century the endowed universities and colleges gained about 36 per cent in attendance and the state universities and colleges about 98 per cent.

Organization. — The American university may be defined, in the terms of its nearest foreign analogue, as a German university superimposed upon an English college. This accounts for the common confusion in the use of the terms "college" and "university." In some endowed universities the arts college is the principal thing, in others it is overshadowed by the graduate and professional schools. Extreme examples of this contrast are Princeton and Columbia, less than fifty miles apart, the former situated in a small town, the latter in the largest of American cities. In Princeton (1911) there were 1295 undergraduates in the college of arts and sciences, and 147 in all other departments of the university. In Columbia the same year there were 1368 in the colleges of arts and sciences and 6613 in the rest of the university. Of the twenty-five institutions chartered prior to the beginning of the nineteenth century only four were distinctively designated in their charters as "universities." Eight of the others have adopted the name university at various times. Harvard has borne the name university on its catalogue ever since 1864, but the official title of the Corporation is still that given it by the charter of 1650: "President and Fellows of Harvard College." The University of Pennsylvania has been the designation of that institution since 1791.

But the term "university" came to be regarded as cheap and pretentious because of its assumption by the twenty-three state institutions founded between 1800 and 1870 and by innumerable denominational institutions, none doing such advanced work as the leading Eastern "colleges." Gradually, in the course of the last quarter of the nineteenth century, however, the conception of a university acquired definiteness in the American mind as an institution composed of several colleges or schools and giving graduate and professional training. In this the German influence was dominant, chiefly exerted through American scholars who had gone abroad for advanced work. The University of Michigan (*q.v.*), remodeled in 1852 by President Tappan in accordance with German ideals, became the pioneer and typical state university. The Johns Hopkins University (*q.v.*), founded in 1876 on German lines, was the first American institution to make graduate instruction and research more important than collegiate work. As this came to be recognized as the distinctive feature of a true university, the leading colleges doing advanced work changed their names accordingly. Yale assumed the title of University in 1887; Columbia and Princeton in 1896. But it is more difficult to persuade a "university," however low its standards and inadequate its facilities, to change its name to college, for to do so would be not only to confess its previous pretentiousness but to relinquish its future ambitions. So it happens that there are many so-called universities doing mostly high school work, and on the other hand some colleges, like Bryn Mawr for women, giving graduate instruction of a high order.

Standardization. — Several agencies have assisted in recent years in promoting the standardization and classification of American institutions and in determining how completely they are living up to their professions. The Carnegie Foundation for the Advancement of Teaching (*q.v.*), having the income on an endowment of $15,000,000 from Andrew Carnegie to spend on retiring allowances for professors of nonsectarian colleges and universities, has made thorough investigations of the requirements, efficiency, and administration of the institutions applying for its benefits. The General Education Board (*q.v.*), with an endowment of $32,000,000 from John D. Rockefeller, has studied especially the geographical distribution of colleges in order to aid those most worthy of support in each locality. The Association of American Universities (*q.v.*), the National Association of State Universities (*q.v.*), the Association of Collegiate Alumnæ, and the various professional societies have been influential in raising standards and defining terms. According to the definition of the National Association of State Universities the "standard American university" must require for entrance to its college department a high school course of four years or its equivalent; it must give in its college of arts and sciences two years of general or liberal work, followed by two years of more specialized work of university character; it must have adequate facilities in at least five departments for three years of graduate work leading to the Ph.D. degree; it must have at least one professional school, such as law, medicine, or engineering, requiring for entrance two years of college work. (For the full details of the requirements see *Report* of the Association or of the United States Commissioner of Education, 1909.)

In formal organization the endowed universities tend to a common type, though with considerable variation in details and nomenclature. A generalized description may be useful, although there are exceptions to almost every statement. The supreme governing body is an unsalaried board of trustees varying in numbers from seven to twenty-eight and meeting as a whole several times a year, sometimes monthly. The board is usually self-perpetuating, though often a small proportion of the trustees is elected by the alumni. Sometimes the governor of the state or other public official is an *ex officio* member of the board. The trustees are in many cases graduates of the same university and usually men of importance in the commercial, political, or financial world, not so often men distinguished in letters, arts, or science. William H. Taft, an alumnus of Yale, served as trustee of Yale even during his term of office as President of the United States. Some of the trustees, especially those living at a distance, attend only the annual meeting of the board, usually held at commencement. A few of the trustees, often men of scholarly tastes and leisure, resident in the place, keep in close touch with the university and devote a great deal of time and attention to its affairs, serving on the executive and other committees. The trustees generally exercise control of the finances of the institution, directing the investment of the endowments, and assisting in the raising of additional funds, often indeed coming to the aid of the university in some special case of need by generous contributions from their own purses. The trustees decide upon the apportionment of the revenue among the several departments, usually in accordance with the budget as prepared by the president of the university. They also pass upon the appointments and salaries of the instructional staff, changes in the curriculum and the requirements for admission and degrees.

Position of President. — On such academic questions the trustees usually accept the recommendations of the president, whose position in regard to the board is somewhat like that of a responsible minister before a European parliament, but the president is responsible not to the faculty but to the board of trustees. If he should fail to gain the approval of the board of trustees for the essential features of his policy, he would naturally resign or might be removed, but a president who has the support of the trustees may remain in power even though there is strong and permanent opposition to him on the part of a large faction of the faculty. The president of an American university occupies a position of unique responsibility and power. In some cases he retains the English title of Chancellor, as for example in New York University among the endowed and the University of Kansas among the state institutions, and in the University of Pennsylvania he is called Provost, but in such cases the office is the same as that commonly called President. The honorary chancellorship of the British universities is entirely unknown in the United States, and the American president has much more power than the British Vice Chancellor or the German Rector or Prorector. The American university president is not *primus inter pares*, a mere chairman of the faculty, but possesses great authority and still greater influence over the whole institution. He is ordinarily the sole channel of communication between the board of trustees and the instructional staff, except of course for such personal intercourse as exists between certain professors and trustees. He presides over faculty meetings as the representative of the trustees and sits on the board of trustees as the representative of the faculty. The heads of all departments report to him, and he embodies such of their recommendations as meet with his approval in his annual report to the governing board. These annual presidential reports of the leading universities, with the accompanying reports of departments and committees and statistical tables, constitute the best source of information on the history of American universities and often contain valuable discussions of the problems of higher education. In the New England college out of which our universities have grown, the president was usually a minister of the denomination founding the institution, and he was expected to teach some of the senior classes, such as mental and moral philosophy. The head of a modern university with its hundreds of instructors and thousands of students and millions of money is absorbed in administrative duties, and such a close personal relation is impossible. The students for the most part see him only as he appears on the platform for a lecture or chapel talk, and regular teaching has been mostly abandoned. The duties imposed upon the modern university president are so multifarious that it is becoming exceedingly difficult to find a man capable of filling the position in the larger institutions. He must of course be possessed of executive ability to manage the complex affairs of the university, involving on its financial side the expenditure and sometimes the raising of more than a million dollars a year. But, however necessary it has become to have a president who is a good business man and money getter, it is still expected that he should be distinguished for scholarship. In recent years presidents have been more often men who have been trained in the physical, biological, and social sciences than in metaphysics, theology, or the classics. The university president needs to be endowed with tact in order to secure the loyal support and coöperation of the diverse elements composing his faculty, and he should have a sympathetic insight into student character in order to keep discipline at a minimum. It is also desirable that a university president should be a good speaker, for he is in constant demand for addresses at the commencement exercises of colleges in all parts of the country and at public meetings. He is often called upon to take part in public movements usually of a nonpolitical character, and to serve on governmental commissions, philanthropic boards, and the like. The progress of a university has come to depend largely upon the initiative and personal force of the president, and in case the head of a university proves to be lacking in leadership or becomes enfeebled by age, it is apt to be outdistanced by its rivals. As conspicuous examples of the influence of a strong personality in molding the destinies of a university may be mentioned Charles W. Eliot (*q.v.*), who in the course of his forty years' administration transformed the old Harvard College into the foremost university of the United States by such innovations as widening the curriculum and making all studies elective; and William R. Harper (*q.v.*), who planned the University of Chicago with many novel features and within ten years made it one of the leading universities of the country.

It is often argued that placing so much power in the hands of one man is anomalous in a democratic country, and complaints are frequently heard of the arbitrary action of university presidents, usually in regard to the dismissal of professors. But the proposal to place the management of the university in the hands of the professors instead of the president has, however, remained so far an "academic" question in more than one sense of the word; partly perhaps because men absorbed in research or instruction dislike to assume executive functions for which indeed some are quite unfitted, and partly because of the fact that those universities where authority has been centered in a strong executive have made more progress than those on a more democratic basis, at least in so far as progress may be measured by its outward evidences, such as wealth, buildings, number of students, etc. The University of Virginia (*q.v.*) under the influence of its founder Jefferson retained longest the democratic form, the faculty administering its affairs and electing one of their number as chairman, but at the end of the nineteenth century it too fell into line and appointed a permanent president with the usual powers.

On account, however, of the size and complexity of the modern university and the impossibility of finding a president who can perform satisfactorily all that is expected of him, a tendency toward decentralization is observable. It is now customary to divide administrative responsibility by placing deans at the head of the various departments and professional schools. There is also a dean for the college with oversight of the life and studies of the undergraduates in arts and sciences, and in the case of coeducational institutions also a dean of women, who is usually a woman of professorial rank. The machinery of management has become more specialized and extensive. A competent office staff, distinct from the instructional, nowadays takes charge of all financial details, and a permanent registrar with assistants keeps the class rolls and compiles the numerous statistical reports required for various purposes. To keep in touch with alumni and to edit the alumni periodical requires one or more secretaries, sometimes salaried by the alumni association. A department of publicity is beginning to be recognized as necessary not so much to manage the formal advertising as to furnish information and photographs for news and descriptive articles for the daily, weekly, and monthly press. It is also necessary to have some one to look after the opportunities for employment of students who are obliged to work their way through, and some one to see to it that the graduates or prospective graduates of the institutions are notified of educational or professional openings. The position of superintendent of grounds and buildings has become one of importance. One or more new buildings are usually in process of erection, and the care of the lecture halls, laboratories, museums, dormitories, heating and lighting plant, roadways and lawns requires the services of a large corps of skilled laborers. A physical director or medical inspector is necessary to watch over the sanitary conditions and the health of individual students, and a hospital or infirmary is provided for those who are ill, especially of contagious diseases. The modern librarian must be a man combining scholarship with business efficiency and must be provided with numerous trained assistants.

University Extension and Press. — The endowed universities are making themselves useful in many ways to those who cannot take the regular courses; by late afternoon and evening classes, notably Pennsylvania, New York, and Columbia Universities; by university extension lectures and correspondence courses, notably the University of Chicago; and by the publication of books and periodicals. The pioneer among scholarly periodicals, the *American Journal of Science*, founded in 1818 by Professor Benjamin Silliman of Yale, was only indirectly connected with that university, but the Johns Hopkins University in 1876 started three other "American Journals" and now publishes eleven periodicals. The University of Chicago Press, which was from the start in 1892 established as a distinct and coordinate department of the University, now issues 19 periodicals besides a large number of books. The 1912 list of the publications of the Columbia University Press includes 145 titles of books in twenty-three different departments. The University of Chicago was the first to develop the possibility of the summer session by putting the work done in the summer term of twelve weeks on an equality with that of the other three quarters of the year, both in the kind of instruction offered and credits given. This proved a very popular and valuable feature of university work, for it brought together from all parts of the country mature students who could not afford to give up their positions to pursue a continuous course of advanced study. In 1911 there were fifty-three universities, endowed and state, having summer schools, usually of six weeks. Columbia University, in the summer of 1912, had 3602 students (1511 men, 2091 women), of whom 1352 were college graduates.

Ecclesiastical Relations. — Although most of the endowed universities were founded by various religious denominations, there is now with few exceptions little difference to be observed between them in the religious affiliations of students or professors, character of instruction, or general regulations. None of the American universities and colleges requires of its students or of its graduates membership in any church or subscription to any creed. Yale was in origin Congregational, Princeton Presbyterian, and Columbia Episcopalian, but they are now entirely free from sectarian control or dominance. Chapel exercises are held once a week or oftener in both state and endowed institutions, but attendance in the larger universities is usually optional, except in Yale and Princeton and some minor institutions. Denominational control in the case of many universities and colleges is secured by the stipulation in the charter that part or all of the trustees shall be elected by the state conference, synod, or similar body. Roman Catholic colleges and universities are owned by the Church and most of them under the control of religious orders, chiefly the Society of Jesus and the Brothers of the Christian Schools. The University of Chicago is exceptional among the greater American universities in that its charter requires that the president and two thirds of the trustees shall be Baptists. The inability of the Carnegie Foundation to grant retiring allowances to professors in institutions under sectarian control has accelerated the shaking-off of denominational allegiance where this had become in the course of time weakened or merely nominal. Theological seminaries are either independent or connected with endowed universities. The state universities do not give degrees in divinity. There is now a tendency for the independent theological seminaries to affiliate with the universities in order to get wider educational facilities. Andover Seminary (Congregational) has recently become a part of Harvard University, and Union Seminary (Congregational and Presbyterian) has erected its new buildings close to Columbia. The number of theological students declined in the last years of the nineteenth century, but since 1903 has been increasing more rapidly than the population.

Degrees and Graduate Work. — The universities, colleges, and technological schools of the United States in the year 1910–1911 conferred degrees on examination on 27,319 persons, 18,524 men and 8,795 women, excluding degrees out of course, honorary degrees, and professional degrees in law, theology, medicine, veterinary medicine, dentistry, and pharmacy. Of this number the more important are: Bachelor of Arts, 11,101; Bachelor of Science, 6542; Bachelor of Philosophy, 1143; Bachelor of Letters, 681; Civil, Mechanical, Mining, Chemical, and Electrical Engineer, 1815; Master of Arts, 2025; Master of Science, 350; Doctor of Philosophy, 450. There were 866 honorary degrees given of sixteen different kinds, including 337 D.D., 237 LL.D., 36 Litt.D., 40 S.T.D., 4 Ph.D., and 139 A.M.

The number of doctorates of philosophy may fairly be taken as an indication of the relative amount of research work done at different times and in different universities. There were 492 doctorates of philosophy (or science) conferred in the United States in the year 1911–1912, which is more than double the average number of doctorates of ten to fifteen years before. During the fifteen years 1898–1912 for which the statistics have been annually published in *Science* the total number of doctorates was 4778, of which 91 per cent were conferred by the endowed universities. But the state universities are gradually increasing their research work, as is shown by the fact that in 1912 the percentage of doctorates conferred by the endowed universities was 77 instead of the usual 91. The leading institutions from the point of view of graduate study are, however, still all of the endowed class. Columbia is now at the top of the list, having conferred 636 such doctorates during the period 1898–1912; Chicago follows with 602; and next in order are Harvard, 536; Yale, 483; Johns Hopkins, 443; Pennsylvania, 375; Cornell, 339. Then comes the first of the state universities, Wisconsin, with 179, most of the state universities standing very much lower still.

The endowed universities had at first practically a monopoly of research work in large part because their professors had more leisure and their funds were freer. In the state universities, owing to the demands of undergraduate instruction in a great variety of subjects, research in pure science had to be carried on, if at all, in spare moments and often under the guise of some utilitarian quest. To cultivate fields of investigation in which the ordinary citizen could see no practical use, the state universities, like the endowed, had to rely upon private beneficence, such as for example provided the state universities of California and Michigan with their astronomical observatories. In recent years, however, the liberal support given to the state universities has enabled them to develop graduate schools, and in some cases, as Illinois, the legislature has been induced to make specific appropriations for non-utilitarian research. The agricultural experiment stations supported in each state largely by federal funds have been of late devoting more attention to the study of the fundamental problems of physics, chemistry, and biology which have a bearing upon plant and animal production. Since these experiment stations are connected in many cases with the state universities (though in one case with an endowed university, Cornell), the opportunities for graduate work are enlarged in these directions.

Doctorates. — The trend of graduate study is also indicated by the number of doctorates; but it must be understood that the popularity of any particular department does not depend so much upon its intrinsic interest or the opportunities for discovery as upon the chances of its leading to a good position. There are more than twice as many research degrees granted in chemistry as in any other science, 291 doctorates in the five years ending in 1912. Now chemistry is a field offering exceptional advantages to the student in search of a dissertation, for the field is unlimited and properly conducted experimentation in almost any direction is likely to lead to the acquisition of new knowledge. Besides this the necessary laboratory equipment is obtainable in any university at comparatively small expense, much less for example than the expenditure necessary for original investigation in astronomy or Egyptology. But the chief reason for the supremacy of chemistry as a research subject is that chemists have a double opportunity of employment; they may become teachers or may go into the industries where their services are of late increasingly in demand. English, which stands next in the order of popularity (155), is often taken with other aims than teaching. Following these the studies most in demand as indicated by the number of times the degree of Ph.D. has been conferred in the five years 1908–1912 are: physics, 135; history, 128; psychology, 116; zoölogy, 112; economics, 108; mathematics, 107; philosophy, 99; botany, 86; education, 73; Latin, 67; German, 66; geology, 65; Romance languages, 61; sociology, 57; Oriental languages, 46; Greek, 41. The sciences and humanities are practically balanced in our universities, for during the five years 1069 doctorates were given in the sciences and 985 in other subjects, but doctorates in many of the sciences are increasing in recent years while in most of the non-scientific studies the number has remained about the same or has decreased. The most marked decline is in Greek, from 13 to 5. The most marked increase is in education, from 6 to 22. In both these cases the influence of the vocational motive is apparent.

Notwithstanding the rapid increase in the amount of graduate work done, the number of doctorates of philosophy conferred annually in Germany is about four times as great as in the United States, which has a population half as large again. So there is no need yet in this country to share the alarm expressed in Germany over the growth of "the learned proletariat." It is, however, recognized that the commercial value of the degree has caused it to be sought for no better reason by many who are unworthy to bear it. It is supposed to be evidence of the ability to do independent and original work, yet in practice it is difficult to refuse it to any graduate student who has acquired a sufficient knowledge of his subject to pass the examinations and has for three or four years carried on investigations under the guidance of his professor. The importance of research work was so energetically stressed in the last quarter of the nineteenth century that it came to be generally believed that no one could be a successful teacher, even of elementary classes, unless he was at the same time an investigator, and furthermore that the possession of a Ph.D. was proof of this qualification. Presidents of minor colleges boasted that they had no names upon their faculty lists that were not followed by the magic initials, regardless of the fact that this was not so much an evidence of the superiority of their staff as it was a confession of lack of confidence in their ability to choose men. The leading universities could by no means show such "clean lists," for many professors in their faculties, and often some of the most distinguished, had no doctorate unless it were honorary.

Graduate Requirements. — Admission to the graduate departments is generally made easy because it is obviously undesirable to put any unnecessary impediments in the way of those ambitious to do advanced work. Usually any one presenting a baccalaureate diploma is allowed to enter graduate courses without much regard to the value or meaning of his degree. But before a student is taken seriously and recognized as a candidate for a higher degree his record is carefully scrutinized from the high school up to see if it meets the requirements of the university, and before entering upon research work he is examined as to his ability to read French and German and such other languages as may be necessary for his purpose. The efforts made in recent years to standardize the degrees have been most successful in the case of Doctor of Philosophy, which accounts in large part for the high esteem in which it is held. It is nowadays never given by reputable institutions as an honorary degree. Its use is practically confined to the comparatively few universities of the country which have well-developed graduate schools, and while it is occasionally conferred by many other institutions, it is in such cases usually justified by the exceptional opportunities afforded by some particular department. The requirements are fairly uniform; ordinarily three or more years of graduate study, at least one year of which is required to be spent in residence, an examination showing a mastery of the field in which the major work is taken and of one or two allied departments, and the preparation of a dissertation involving research and some new contribution to knowledge or an original treatment of the subject. The candidate is required in most universities to publish the dissertation at his own expense and to provide the library with 50 to 200 copies for exchange, but since publication or the delivery of the completed manuscript with the necessary deposit to cover the expense is not always required in advance of the granting of the degree, the dissertation from various causes sometimes fails to appear in print. The obligation to publish is regarded as important if for no other reason than that it serves to introduce the new-made doctor to the scholarly world and that it gives an opportunity for other universities to judge of the quality of the work required by the institution conferring the degree, although it is recognized that these dissertations are not always of sufficient intrinsic value to merit publication in full and that, being produced in such large numbers in the United States and Germany and sometimes written in an unnecessarily arid and prolix style, they tend rather to encumber than to facilitate future research. In the exact sciences these contributions are usually brief enough to secure publication first in the ordinary journals. Those in sociology, political economy, history, philosophy, and literature, being longer, are generally printed in the serial publications of the university. Where the subject is one of popular interest, the doctor's thesis often serves as the basis for a book, circulated through the ordinary trade channels. (The doctor's dissertation was discussed at the ninth annual conference of the Association of American Universities.)

The candidate for the degree of Ph.D. is usually required to pass a written and an oral examination, but there is great variation in the form of the latter, even in different departments of the same institution. In some the examination consists of a brief and informal "quiz" in the professor's office by a committee of three. In others it is a stately function where academic costume is required and the candidate is subjected to a cross-examination of three hours by a dozen or more professors representing various departments. In some cases the thesis presented by the candidate forms the principal subject of examination; in others it is not touched upon. In some cases the examination is open to other graduate students and to the public; in others it is strictly private. It is customary to distinguish those doctors who have done especially good work for the doctorate by adding to the diploma the words *cum laude*, *magna cum laude*, or in rare cases *summa cum laude*.

The degree of Master of Arts and its equivalent, and sometimes synonym, Master of Science, has not yet been so well standardized as the Doctor of Philosophy. It is ordinarily attainable by a year of graduate study upon the passage of a special examination and the preparation of a thesis which, however, is not always published and does not, like the doctor's dissertation, imply the possession of the ability to carry on independent research. The M.A. degree is now never given without further work to graduates of several years' standing on payment of a fee, as is the custom in England and was formerly in this country.

In the multiplicity of degrees for courses differing only slightly the question arises whether a second degree should be given to a student who had taken the studies required for it but not included in the first course. This has been opposed on the ground that it was unfair that the same studies should be counted twice for degrees, but it has generally been conceded that a degree is to be granted whenever the work prescribed for it has been completed without regard to how much the work may overlap. The question was most difficult to decide in the case of the overlapping of the college and professional schools. Can a student, for example, who took bacteriology as an elective in the junior or senior year of his college course count it also toward his M.D. degree when he enters the medical school where it is required ? If not, should he be made to substitute for it something not required of other medical students ? But on the other hand, if the student is allowed so to anticipate his professional work the temptation is strong to put as much as possible into his college course, and so to crowd out the cultural and non-vocational training which it was the purpose of the college to provide. The student who left the college at the end of his junior year to enter a professional school of the same or another university could often claim with reason that the studies he had pursued there were quite as liberal and cultural as some that were allowed in the senior college year, that they were pursued with even more earnestness and thoroughness, and, therefore, that he was entitled to the bachelor's degree just as though he had remained in college. In the prolonged discussion of this question, it was argued on the one side that students entering directly from the high school upon a medical or engineering course composed exclusively of professional studies were not receiving what could worthily be called a liberal education, and that their lack of culture and a broad outlook prevented them from making the most of themselves or of their technical training. On the other side, it was urged that to require a young man to spend four years in college and four in the medical or engineering school with perhaps a year or more of graduate study, hospital practice, or travel, would bring him well toward thirty before he was well established in his profession, and able to marry. Some even went so far as to say that the American college had become "an institution for the artificial prolongation of boyhood," and that its atmosphere of sport, irresponsibility, and scholarly leisure was not favorable to the cultivation of those qualities needed for success in professional work (see GRADUATION, AGE OF). It is true that the students in a professional school work as a rule much harder than in the college of arts of the same university, chiefly because they feel that what they do in their professional studies has a direct effect upon their chances for success in life; but the idea that it is common for a young man who has idled in college to turn over a new leaf when he enters the professional school and make a good record is altogether false. An examination conducted by President Lowell into the records of Harvard University for thirty years back showed quite the contrary, — that the students who did the best work in the law or medical school were apt to be those who had done the best in their college work; and he draws the conclusion that in regard to the kind of preparation needed for professional studies "it makes vastly more difference how well a man works in college than what he has taken." Harvard is the only university that requires a bachelor's degree for entrance to any of its professional schools, but the severity of the requirement is modified by the fact that students are permitted and encouraged to do all the required work of the college in three instead of four years, as formerly. The other universities have adopted the plan first definitely formulated at Columbia and known as the "combined course." This ordinarily enables the student to complete both the collegiate and professional courses in six or seven years; that is, a general college course of three years followed by a professional or technical course of four years as in the case of medicine or engineering or of three years in the case of law. The baccalaureate degree may be given at the end of the fourth year from the beginning.

Changes in Curriculum. — The revolutionary changes which took place in the universities in the latter part of the nineteenth century were due chiefly to two influences; first, the demand for the admission to the curriculum of new studies, especially the sciences, which claimed cultural and disciplinary value equal to that of the humanities and greater utility than these; and, second, the demand for training in other vocations than the three established learned professions of law, medicine, and theology. These demands were met in various ways in different universities by a process of concessions, compromises, and adjustments which is still going on. Generally the new studies, which included not only various branches of physical and biological science but such subjects as modern history, political economy, the literature of other languages than the classics, etc., were first admitted as electives in the junior and senior years and so forced their way through the whole undergraduate course and even lower. On account of the rapid increase in the number of students, due in large part to the popularity of the new studies, the loss of the older departments was only relative, not absolute. Greek no doubt suffered a decline when it was no longer required for entrance, but elementary Latin is studied by greater numbers than ever before.

The second demand, that for the admission of new vocations, was more reluctantly conceded. In some cases, Yale and Harvard, for example, provision was made for them in a separate, almost independent, school of applied sciences or engineering with a shorter course and lower requirements for admission and graduation. In Yale the Sheffield Scientific School was at first regarded by the college or academical department as an alien and very inferior institution, but it has grown and raised its standards so that it rivals the college in size and prestige, and its graduates are now admitted on equal terms to the Yale alumni association. In Harvard, on the other hand, the Lawrence Scientific School after sixty years was absorbed, and ceased to exist when the professional and technological schools were placed on a graduate basis.

The endowed universities differ considerably in the organization of their faculties, for this is largely controlled by the accidents of growth, the limitations of endowment, etc. In some the dominant grouping is by schools, in others by departments. In the latter case all of the instructors of whatever rank in a certain subject, say English, will meet regularly as a distinct body. In the former case each professional or technical school forms a separate unit and, for instance, a teacher of chemistry in the college of arts will be quite independent of his colleague who teaches chemistry in the engineering school. The graduate work is now almost always organized as a distinct school under a dean and faculty of its own, though usually the professors give undergraduate courses also. Such a graduate school, however, does not ordinarily include the research work done in professional fields, say the medical. In Columbia a unique organization of graduate work obtains, for there are three distinct graduate schools, of Pure Science, Political Science, and Philosophy.

Instruction. — The rapid growth of the American university in wealth, numbers, and complexity has made it an institution quite unlike anything now existing elsewhere or formerly in the United States. The eleven endowed institutions belonging to the Association of American Universities had in 1911 a combined attendance of over 40,000 students of all sorts. Fifty years before, the five institutions then in existence, Columbia, Harvard, Pennsylvania, Princeton, and Yale, had altogether about 2700 students. If we consider distinctively university work, the advance is still more striking. The total number of graduate students in 1861 was about twenty. Now it is considerably over 6600, the number reported, because the graduate students in professional schools are not usually included. If it had been merely a matter of providing the same kind of instruction to a larger number, there would have been no serious difficulty, but the multiplicity of courses has necessitated a proportionate increase in the instructional staff and the experimental sciences have involved unprecedented expenditure for laboratories and apparatus. In addition to these demands the general decline in the income from securities and the concomitant rise in the cost of living has made it necessary to secure larger endowments. Tuition fees have had to be increased, but the increase could not be in proportion to the expense of instruction because of the burden that this would place upon poor students.

The character of the instruction and the relation of teacher and pupil have been greatly altered by the development of the university. With a class of several hundred the old form of recitation becomes impossible. When the German university ideal was dominant the tendency was to discard textbooks, to give all instruction by lectures, to rely upon examination papers, mostly read by assistants, for knowledge of the progress of the students, and to allow them to stay away from the class whenever they liked. But it was soon realized that this plan did not work well with the majority of students, at least in the earlier college years, so now it is customary to require daily attendance and regular preparation of assigned tasks, and where lectures are given to large classes the students are divided into sections once or twice a week for "quizzing." Various devices have been tried to bring the students into personal relations with the instructors. Where the elective system prevails, each student is assigned on entrance to some member of the faculty who acts as his "adviser" and is expected to become acquainted with the student's circumstances, disposition, and aims and to counsel him in the choice of studies so that he may pursue a consistent and well-balanced course. But the advisers often take little interest in the personal welfare of their students, and sign the course cards perfunctorily. Princeton has taken the most radical step in the effort to secure closer personal guidance by the adoption of a plan based upon the English tutorial system. "Preceptors" are there appointed in each department who meet the students assigned them individually or in small groups for informal conference and to encourage them in collateral reading.

The introduction of laboratory courses and research work in the sciences has in another way brought student and instructor together, for here the instructor is not so much a taskmaster as a collaborator. Corresponding to this in other departments, such as history and political science, seminars were introduced where the professor met a small group of advanced students for informal conference on some investigation in which they all were engaged. This works well so long as it is kept to its original purpose, but the seminar of a distinguished professor is apt to become overcrowded, in which case the instruction naturally reverts to the ordinary classroom or lecture type. Opportunities for more informal association of faculty and advanced students are afforded by the departmental clubs or journal meetings, where recent discoveries are reported and discussed. Such societies in a way take the place of the general literary societies which formerly flourished but have now declined in importance except in the smaller colleges.

Women in Endowed Universities. — The endowed universities of the West, as well as the state universities, are coeducational in both graduate and undergraduate departments, but in the East it is not customary to admit women to undergraduate courses. Cornell and Syracuse, both in New York State, are the largest endowed universities in the East admitting women to all departments. Some universities provide separate colleges for women, such as Radcliffe at Harvard, and Barnard at Columbia. But all of the leading endowed universities except the Catholic University of America and Princeton admit women to their graduate schools and in general grant them the higher degrees on the same terms as men. The objections that are raised to coeducation by its opponents concern mostly the questions of the propriety and advisability of daily social intercourse between the sexes during the period of adolescence and do not apply to the graduate courses, which are sought chiefly by women of mature years and serious intent. Then, too, the women have a much stronger claim for admission to the graduate school than to the college, for to deny them access to such courses in the leading universities would be to shut them completely out of advanced work in certain branches where the instruction and faculties are not and could not be duplicated in the women's colleges or state universities. There was strong opposition at first in the older universities to the admission of women as graduate students, and some professors still refuse to have them in their classes, but almost everywhere they are now tolerated if not welcomed. No difficulties of any moment have arisen, and the result of an investigation of its workings made for the Association of

American Universities (1905) was that coinstruction in graduate schools presented "no problems beyond trifling matters of detail." In the endowed universities belonging to the Association the average proportion of women in the graduate schools varies from 11 per cent at Yale to 34 per cent at Stanford. The ability of women to master advanced studies in any department is now unquestioned, but it is the prevailing opinion that they are as a rule inferior to men in work requiring initiative and originality. Women are now admitted on terms of equality to many of the professional schools even of the Eastern endowed universities, for example, the law schools of New York University and the University of Pennsylvania, and the medical schools of the Johns Hopkins and Cornell universities. In institutions where they have freedom of choice women are most numerous in the departments of arts and letters; not so many of them are to be found in the sciences, few in medicine, fewer still in law and very rarely one in engineering. In the summer schools even of the most conservative universities, all courses, undergraduate as well as graduate, are usually open to both sexes and are largely attended by women, especially teachers.

The Influence of State and Endowed Universities upon Each Other. — Since they duplicate work to a considerable extent and draw their students from the same territory, it might be supposed that the competition would be injurious and that one class of institutions would thrive at the expense of the other. Experience has shown that on the contrary there is a wholesome rivalry, generally beneficial to both, and that neither could be dispensed with without serious loss to the country. The Leland Stanford Jr. University was opened in 1891 within thirty-five miles of the University of California and although Stanford, unlike the other endowed universities, charges no tuition, the state university has grown and prospered as never before. The establishment in the following year of the University of Chicago has not interfered in the least with the development of the state University of Illinois. The endowed universities charge about $150 tuition a year and the state universities are practically free, yet the endowed universities continue to draw students from all parts of the country, including the territory where the best state institutions are situated. Among the motives impelling young men and women from the West to go to the endowed institutions in the East may be mentioned the following, of varying importance and validity, but all in some cases influential; the opportunities for more advanced work; the reputation of professors; the cultural atmosphere; the prestige of an old and famous institution; the pleasures of campus life; the attractions of beautiful or historic buildings; prominence in athletics; the opportunities for making friends who will later be of advantage in political, business, or social life; the advantages of travel and of access to great libraries, museums, and galleries; personal influence of alumni; and the example of parents, for in some families the same university is attended by several successive generations. On the other hand, comparatively few young people leave the East for the express purpose of attending the state universities of the West. E. E. S.

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UNIVERSITIES, AMERICAN STATE. — General Characteristics. — The term state universities is used in the United States to describe a group of universities each of which has been created or adopted by a commonwealth and is now organized, supported, and administered by the commonwealth through its own agents acting under its direct control. The growth of these great and complex institutions from comparative unimportance in 1860 to their present position of commanding influence in thirty-nine of the states of the Union is one of the most significant and impressive features of the history of higher education during the last half century. The principle of public aid to education of all grades was clearly recognized and often applied in the seventeenth and eighteenth centuries by the colonies of Massachusetts Bay and Connecticut; scores of grants of money were made to Harvard College and Yale College, and similar appropriations were made to other private or autonomous colleges. But the principle of direct creation or administration by the state remained to be worked out in the Old Northwest and in the greater West. There the logical result is the assumption by the state of the control and coördination of education in all its forms, with the exception of theological education.

The state universities are thus the vitalized expression of popular sovereignty thinking its highest thought in education and cultural organization. They touch the finer life of the commonwealths at every point, and represent the conviction that the state is bound, as a condition of its safety and perpetuity, to provide from its own resources both a sound and well-adapted general education for all its citizens, and a higher and more exacting education and discipline for those who are to be its leaders and inspirers. While it believes, with Professor Hinsdale, that it cannot "be regarded as consistent with the spirit of a free country to deny its citizens the possibilities of the highest knowledge," its great concern is the generation of practical wisdom, mental agility, noble ideals, and a spirit of service to the state, and it has ordained the state university as the fittest instrument for accomplishing this high end. As a group, the institutions thus founded know neither creed, nor social class, nor race (save in the Southern states which make separate provision for the negro). They are linked with the public schools; they are practically tuitionless; and they are alert for opportunities to enlarge their usefulness to the industrial and administrative interests of the state.

Loyalty to this democratic theory of education, often felt vaguely and expressed fumblingly, has really been the salvation of the state university system. Amid the pioneer conditions of Ohio, Minnesota, Washington, and Arizona, — and in some states this was no further away than the early eighties of the last century, — this unfaltering belief in higher education led the frontier legislatures to provide for a "seminary" or university. At first this was done indirectly or irregularly, through some private foundation, but later each state, by constitution or statute, as a matter of course or of self-respect, provided for a state university, thus illustrating the fact that educational progress is rather from the top downwards than from the bottom upwards. There was in reality no other alternative to remaining indefinitely without collegiate education. The pioneer settlers of the West, frequently men of education and refinement, were generally poor; the demand for capital for constructive enterprises was imperative, and none was likely to be diverted to educational endowments; the wealth and benevolence of the East were as far away as were London and Oxford from the colonies in the seventeenth century. Land, however, was abundant, and it is not surprising to find both federal and state governments, beginning with the Northwest Ordinance of 1787 and the action of the Board of Treasury of the Confederation of the same year, making grants of land in aid of higher education: "Not more than two complete townships to be given perpetually for the purposes of a university" in the Ohio grant. Since the admission of Ohio in 1802 nearly every new state has received one or two townships of public land for university uses, and has usually devoted it to the state university. This far-sighted public policy in state after state put higher education at least a generation ahead of the position it would otherwise have occupied.

While the makers of such early state universities as those of Indiana, Michigan, and California could not have foreseen the tremendous expansion of the demand for higher education which characterized the last of the nineteenth century and the first of the twentieth, their instinct and judgment combined to shape instruments well devised to meet these unprecedented demands, and to work out at the same time an adjustment with secondary and professional education. It is inconceivable that any agency other than the state could have so promptly created and so generously supported such a vast system of institutions for collegiate, technological, and professional training of both men and women, with all the courageous and necessary experimentation, differentiation, and adaptation which were necessary to secure progress. The forty-two state universities enumerated in the table on page 678 represent in round numbers, for 1910–1911, a total of 60,000 students of collegiate rank or above; a valuation of plant, excluding unsold lands, exceeding $73,000,000; an income-producing endowment of $26,000,000; and an annual income of $19,000,000 which, if capitalized at 5 per cent, would be equivalent to an endowment of nearly $400,000,000.

Variety and Number of State Institutions of Learning. — So much the states have done for their universities. But this is far from presenting an adequate idea of what these states are doing for higher education and research within their boundaries. To obtain such an idea the figures given in this table should be enlarged by corresponding figures for the great separate state colleges of agriculture and mechanic arts, schools of mines, special schools of forestry, ceramics, etc. There are, in all, more than fifty institutions with functions somewhat like those of the state universities, excluding schools for the negro, now receiving more or less regular appropriations from state treasuries. The Iowa State College of Agriculture and Mechanic Arts, for example, is only one of twenty-seven such institutions organized separately from state universities, yet in 1910–1911 its registration of students was 1564, and its income $771,000.

Though nine states have no state universities, every state has some tax-supported agency for higher education, not counting normal "colleges" nor institutions solely for negroes. Eighteen concentrate their support in a single institution, calling it a state university; thirteen divide it between two institutions; ten divide it among three or more. Indiana, for example, supports Indiana University and Purdue University, two well-coördinated and substantially equal institutions; Colorado has its University, its Agricultural College, its School of Mines, and its State Teachers College; Washington has its University and its State College, competing vigorously in almost every line save agriculture, even duplicating such specialized courses as those in mining engineering, and forestry. The relation of the great state of New York to Cornell University, to which it granted in 1910–1911 about $281,000, and of Maryland to Johns Hopkins University, make these institutions almost state universities, but in neither case can the state exercise any real control over their administration as a whole. Pennsylvania supports the Pennsylvania State College, which is essentially an undergraduate college of arts, agriculture, and technology, and also appropriates money in large sums to the University of Pennsylvania and to the University of Pittsburgh, both independent of the state control.

Scope of Work. — The state university, by the nature of its organization, must be responsive to the needs and demands of the people of the commonwealth whose it is and whom it serves. In the beginning it was the regular classical college, slightly modified, showing the strong influence of the semi-aristocratic colonial and English educational traditions. The liberal wisdom of Thomas Jefferson in founding the University of Virginia in 1819 with broad provision for the sciences and philosophy had less influence upon the western universities than might be expected; they followed rather the New England model, and Harvard and Yale rather than Virginia became the mothers of university presidents. The University of Michigan, organized for instruction in 1841 and reorganized in 1851 with an elective Board of Regents, broke away from the older tradition, and, under the inspiration of men who admired the Prussian ideas of the organization of education, broadened and enriched its courses of study. Its school of medicine was opened in 1850, followed by the law school in 1859. Thus the state university movement early got a Continental impress and ideal instead of those of England considerably attenuated.

By an act of the legislature in 1851, the University of Michigan was required to provide a modern, or less classical course than it had had before that time, and in 1855 it conferred upon two students the degree of Bachelor of Science, which was first conferred, in 1851, by the Lawrence Scientific School of Harvard. Elective studies appeared in the curriculum in 1855–1856. In response to another need, this university inaugurated in 1870 the plan of admitting without examination students from affiliated (or approved or accredited) high schools, in this way reënforcing in a manner at once powerful and sympathetic the movement for better secondary schools.

Opportunities for Women. — In yet another way the responsiveness of the state university to the changing sentiment of its constituency is well illustrated. The early opening of the doors of these institutions to women on an equality with men was antedated by like action only in the cases of Oberlin College (1833) and Antioch College (1853). The admission of women to the State University of Iowa began with its first year of instruction in 1855; Kansas (1866), Minnesota and Indiana (1868), and Michigan and Missouri (1870), followed, and the state universities became thenceforth the strongholds of coeducation. At the present time every state university admits women except those of Virginia, Georgia, and Florida (which maintains a separate State College for Women), and practically North Carolina and South Carolina. If coeducation is tolerated in the Southern States, and accepted in the Eastern States, it is certainly approved in theory and practice in the Western State universities, and no one would seriously propose reversing the present policy of perfect equality of opportunity for both sexes in these tax-supported institutions.

Influence of the Morrill Act. — A further and most powerful reënforcement of the tendency to modify the old curriculum came from the federal government in the epoch-making grant to each state by the act of congress of July 2, 1862, known as the Morrill Act (*q.v.*) of 30,000 acres of public land for each member of congress from such state, for "the endowment, support, and maintenance of, at least, one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the pursuits and professions in life." (See National Government and Education.)

Many of the state universities owe their initial impetus, and the direction which they were to follow, to this new measure of generosity on the part of the federal government, enlarging a policy begun sixty years before in the grant of one or two townships to each new state on its admission for a seminary or university. Every state ultimately accepted this new grant, and in twenty the state university was made the beneficiary, thus obligating it to give special attention to the promotion of a "practical education of the industrial classes in the pursuits and professions in life."

The Morrill Act provided for both agriculture and the mechanic arts without discrimination, but economic conditions in the newer states were such that the stronger emphasis was placed upon mechanic arts and that term was broadly interpreted to mean engineering rather than trades and crafts. Land was abundant and the need for scientific agriculture was seen dimly or not at all, while roads, bridges, railroads, factories, mills, electrical plants, and mining enterprises were calling loudly for engineers. The state universities, therefore, very soon advanced from a liberal treatment of the pure sciences to elaborate equipments and great faculties for teaching applied sciences, first in the field of engineering, and then at length in the field of agriculture. The instruction in these newer subjects which invaded the realm of the liberal arts was frequently secondary instead of collegiate, and the schools organized on this grade have not all been abolished. The successful School of Agriculture opened by the University of Minnesota in 1888 is still carried on alongside the College of Agriculture; in 1909-1910 the College registered 238 students, and the School 704 students, besides 681 persons registered in the agricultural summer courses, farmers' short courses, etc. Secondary schools or departments have, however, been largely given up, as the system of high schools has gained strength and stability. Minnesota gave up secondary work, save in agriculture, in 1891, Colorado in 1907, and Illinois in 1911; Florida, Kentucky, and Utah transformed the preparatory department into a model school for their departments of education; ten state universities, including West Virginia, South Dakota, Louisiana, and Arizona, still maintain from one to four years of a secondary course.

Relation to Secondary Schools. — The relation of the state universities to the secondary schools of their states is of tremendous importance, for no small part of their services has been the patient, sympathetic, stimulating support of every wise effort to expand and improve the public high schools. Each party to the relation is vitally dependent upon the other; the university must have soundly prepared students if it is to do its proper work; it must help the high schools to prepare these students at the same time that the schools prepare the larger number of their pupils for other activities than those of the university; the high schools must have thoroughly trained and inspiring teachers, and the demands for such teachers are steadily greater than the universities can supply, even with the increasing percentage of their graduates entering secondary school teaching as a profession. Very significant are the figures for this increase in such universities as Michigan, where the percentage of total graduates going into educational work rose from 1.2 per cent for the years 1846-1850 to 18.3 per cent for 1896-1900. In contrast with these ratios, Columbia University, in the same years, sent into educational work less than 5 per cent for each period.

Technical and Professional Schools. — On the other side, the state universities as the agents of the state have undertaken technological and professional education on a new basis, eliminating the element of profit which so long retarded progress in the professions of medicine and dentistry, and steadily raising standards of equipment and instruction. The most remarkable improvement has taken place in medical education in the West, where the state universities have followed courageously in recent years the lead of Harvard and Johns Hopkins. The University of Michigan opened its department of medicine and surgery in 1850 with a course of two years of six months each; this was extended to nine months in 1877; a third year was added in 1880, and a fourth in 1890. Minnesota has gone a step farther, adding a required fifth year to its medical course for students entering in 1911 and thereafter, which must be a year in hospital service for practitioners or a year in the laboratories for those who intend to teach in medical schools. A consistent application of this principle of state control of medical practice and medical education within the state has resulted in the concentration of all medical education in the state university in eleven states. Full four-year courses are given in Arkansas, Colorado, Indiana, Minnesota, Oklahoma, and Vermont, and the first two years only in Mississippi, North Dakota, South Dakota, Utah, and West Virginia.

Graduate Instruction and the organization of graduate schools were naturally slow of development in state universities, and in some instances they were considered both practically and theoretically undesirable. But universities like Michigan, Wisconsin, and California demonstrated the wisdom and value of fostering the finest scholarship and the most advanced research. Illinois led the way in definite appropriations for a graduate school, receiving $50,000 a year since 1907, followed by Indiana and Minnesota. With few exceptions, the state universities now have separately organized graduate schools in operation, or have provided in their scheme of organization for such schools, but besides those just enumerated, not more than seven, and these in a few fields only, are properly equipped to carry students to the doctorate in philosophy or science, *e.g.* the University of North Carolina in chemistry.

Affiliated Research Organizations.— In affiliation with many of the state universities or as organic parts of them, are various administrative and research bodies, under the control and supervision of some university officer. Illustrations of these are the State Conservation Commission, the State Geological Survey, and the Bureau of Plant Diseases and Destructive Insects, at the University of Nebraska; and the State Laboratory of Natural History, the State Entomologist's office, the State Board of Examiners in Accountancy, the State Geological Survey, and the State Water Survey, at the University of Illinois. Unfortunately the legislature has not always kept clear the distinction between research work and scientific exploration and survey, on the one side, which may properly be undertaken by the state's university, and routine work of analysis, inspection, etc., on the other, which should be placed with a purely administrative office. The real meaning of this movement to assign these various functions to the state university becomes clearer year by year; they indicate, as President Van Hise of the University of Wisconsin has well said, a settled recognition of the state university as the "expert adviser of the state" in the fields of science, industry, economics, administration, agriculture, engineering, and social problems, in addition to its function as the great teacher and ennobler of the youth of the state.

Supervision and Control. — The legal supervision and control of universities of this group is usually vested in a board of regents or trustees composed of persons appointed by the governor with the consent of the senate, with the addition of certain *ex officio* members. Only in exceptional cases are the members paid more than a modest per diem for their services, and actual expenses while in the discharge of their duties. Broadly speaking, these boards have been singularly free from partisan and personal political influences, though in some of the newer states like Oklahoma, Wyoming, and Kansas notable exceptions have occurred. Positions on the boards are looked upon as places of honor and dignity, with large opportunities for public service, and are frequently filled by men of great business experience and acumen. The table on following page gives detailed data regarding the composition, term, etc., of the boards in question.[1]

Support. — The forms of support of the state universities fall under four heads: state appropriations, federal land grants and appropriations, gifts from individuals, and student fees. *Direct appropriations* are made by the state legislatures for current expenses such as salaries, apparatus, supplies, repairs, and publications, and for improvements such as new buildings, additional lands, and special undertakings. Many states make these appropriations annually or biennially, either in a lump sum or in itemized, specific form, placing the administration of the funds in the hands of the regents or trustees. Others provide permanent revenues from general taxation, running indefinitely, sometimes fixing a sliding scale of increases. Still others have adopted the continuing mill tax for educational institutions, *e.g.* Colorado, with a tax of $.0004 on the total of assessed valuation of the property of the State, thus creating a special fund which may not be used for other purposes. The advantages of this last method are obvious and positive, for it gives a revenue which increases automatically with the development of the state and the growth of the university, which still keeps the institution responsible to the state for its stewardship through detailed annual reports, and which yet relieves it from the necessity of campaigning in each legislature to convince that body of the just needs and rightful claims of the institution for support. The method has, therefore, been widely adopted, with strong indications that it will spread still further; in 1912 fourteen state universities received a large part of their income from some form of mill tax, the rates varying from one twentieth of one mill in Kentucky to one mill in Illinois and Nebraska.

Land grants by the federal government to the states for educational purposes have already been described, with emphasis on the fact that in the majority of cases this land became the primary endowment of the state universities of the Western States. Some of the states disposed of these lands early and in reckless haste, with comparatively little endowment as the result, while others, restrained by prudent foresight as well as by constitutional prohibitions of sale below a minimum price (in South Dakota $10 an acre), have now magnificent incomes from investments and leases. The University of North Dakota, on the admission of the state into the Union, was granted 126,000 acres of public land; from the sale of this it has an invested endowment of $1,680,000, with 35,000 acres still unsold. To a few states, like Indiana and Alabama, Congress has made special grants, usually of a compensatory nature, for their universities.

The twenty-one state universities which received the land grant under the Morrill Act of 1862 were further beneficiaries of the United States under four later acts of congress: the acts of 1890 and 1907 (supplementing the act of 1862), in accordance with which each state now receives and turns over to its university, less a portion reserved in eight southern states for institutions for the negroes, a total of $50,000 annually; and the acts of 1887 and 1906, under which the agricultural experiment stations connected with these

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[1] In the case of Cornell University, the quasi-state university of New York, from which it receives large revenues, the state controls only ten of the thirty-nine members of the board of trustees, five of these being state officers holding *ex officio*.

State University of	Governing Body	Total Number	Ex Officio	Appointed or Elected	Term	Method of Appointment or Election
Alabama	Board of Trustees	12	2	10	12 yrs.	Self-perpetuating, subject to confirmation by the senate of the state
Arizona	Board of Regents	6	2	4	4 yrs.	Governor and senate
Arkansas	Board of Trustees	7	1	6	6 yrs.	Governor and senate
California	Board of Regents	23	7	16	16 yrs.	Governor and senate
Colorado	Board of Regents	7	1	6	6 yrs.	General state election
Florida	Board of Control of State Educat. Inst.	5	–	5	4 yrs.	Governor
Georgia	Board of Trustees	26	8	17	8 yrs.	Governor and senate, and one life member
Idaho	Board of Regents	5	–	5	6 yrs.	Governor
Illinois	Board of Trustees	12	3	9	6 yrs.	General state election
Indiana University	Board of Trustees	8	–	8	3 yrs.	5 elected by state board, 3 elected by alumni
Purdue University	Board of Trustees	9	–	9	6 yrs.	Governor and senate
Iowa	State Board of Education	9	–	9	6 yrs.	Governor and senate
Kansas	Board of Regents	7	1	6	4 yrs.	Governor and senate
Kentucky	Board of Trustees	18	3	15	6 yrs.	Governor and senate
Louisiana	Board of Supervisors	15	3	12	4 yrs.	Governor and senate
Maine	Board of Trustees	8	–	8	6 yrs.	Governor and senate
Michigan	Board of Regents	9	–	9	8 yrs.	General state election
Minnesota	Board of Regents	12	4	8	6 yrs.	Governor and senate
Mississippi	Board of Trustees	10	2	8	6 yrs.	Governor and senate
Missouri	Board of Curators	9	–	9	6 yrs.	Governor and senate
Montana	State Board of Education	11	3	8	4 yrs.	Governor and senate
Nebraska	Board of Regents	6	–	6	6 yrs.	General state election
Nevada	Board of Regents	5	–	5	4 yrs.	General state election
New Mexico	Board of Regents	7	2	5	4 yrs.	Governor and senate
North Carolina	Board of Trustees	83	3	80	4 yrs.	State legislature
North Dakota	Board of Trustees	5	–	5	4 yrs.	Governor and senate
Ohio State University	Board of Trustees	7	–	7	7 yrs.	Governor and senate
Ohio University	Board of Trustees	21	2	19	Life	Governor and senate
Miami University	Board of Trustees	27	–	27	9 yrs.	Governor and senate
Oklahoma	State Board of Education	7	1	6	6 yrs.	Governor and senate
Oregon	Board of Regents	14	3	11	12 yrs.	Governor and senate
South Carolina	Board of Trustees	11	4	7	6 yrs.	State legislature
South Dakota	Regents of Education	5	–	5	6 yrs.	Governor and senate
Tennessee	Board of Trustees	16	4	12	12 yrs.	Governor and senate
Texas	Board of Regents	8	–	8		Governor and senate
Utah	Board of Regents	13	2	11	4 yrs.	Governor and senate
Vermont	Board of Trustees	20	2	9 9	6 yrs. Life	9 elected by legislature Vacancies filled by remainder of the nine
Virginia	Rector and Visitors, and Alumni Trustees of Va. Endowment Fund	11	2	9	4 yrs.	Governor and council
Washington	Board of Regents	7	–	7	6 yrs.	Governor and senate
West Virginia	State Board of Regents (Education)	5	1	4	4 yrs.	Governor and senate
	State Board of Control (Finance)	3	–	3	6 yrs.	Governor and senate
Wisconsin	Regents of the University	15	2	13	6 yrs.	Governor and senate
Wyoming	Board of Trustees	11	2	9	6 yrs.	Governor and senate

universities, except in Ohio and Georgia, receive annually $30,000 for experimentation, administration, and advanced research, in agriculture and closely allied departments such as irrigation. Out of the total annual appropriation by the federal government under these four acts, amounting to $4,045,000, the state universities get about $1,500,000.

The University of Texas received no federal grants, since that state retained on its admission all public lands within its boundaries; from these lands the university was granted one tenth of all sections reserved for state uses, in addition to fifty leagues given in 1839. The accumulated endowment from sales was in 1910 nearly $650,000, while leases of the remaining 2,000,000 acres produced $121,000.

Gifts and bequests to state colleges and universities by individuals for endowments or for buildings have been relatively few and rarely very large. Because these institutions are the creatures of the state and supported by the taxation of all, they have not been considered, until recently, even by their own alumni, as objects of private benevolence; they have grown up in a region where the habit of giving largely to education and charity is just becoming well rooted, where too ready reliance is still placed upon eastern philanthropists. Stimulation and organization of the loyalty of graduates have been given scanty attention in comparison with the shrewd, systematic, and successful cultivation of their alumni by the great endowed private institutions. Now that the alumni of the state universities take leading parts in state and local government, the need of keeping them informed and interested is quite apparent. It has taken much time, too, for the universities to overcome the proper scruples of sensible and benevolent persons who hesitated to intrust their gifts to any agency of the state so long as the state government was in the sad condition of inefficiency and immorality characteristic of many of the greater commonwealths. Fortunately it is now scarcely a matter of question that the state universities are practically entirely divorced from the politics and the business methods of the ordinary state government; they are as stable in constitution and as aggressively faithful to scholarship, research, and social service as the noble private foundations; and they are now reaping their reward in a generous appreciation of their trustworthiness and their wisdom, which takes the form of great gifts for far-reaching research and for aid to students, as well as for buildings and tangible things.

Certain gifts to state universities in the past has been highly significant, even in an age of imperial giving of a Roman sort. Besides large donations to the state universities of Vermont, Michigan, Minnesota, Indiana, Kansas, Georgia, and North Carolina, usually for buildings or for constructive purposes, special mention should be made of great private gifts to three other universities. The University of Virginia in 1909 was enriched by $2,000,000 given by Andrew Carnegie and other private citizens. By the will of Hon. William F. Vilas, who died in 1908, an alumnus, professor, and regent for many years of the University of Wisconsin, that institution will receive his whole estate, appraised at about $1,900,000, upon the expiration of two life interests. The University of California has also been a leader in the matter of gifts ever since it received from James Lick in 1875 $700,000 for an astronomical observatory; in later years the large gifts alone have been numerous, and now total more than $2,000,000 for endowment and $1,500,000 for buildings; besides these, continuing annual grants from private sources for scholarships, research, and exploration represent about $500,000 more.

Student fees in state universities are usually confined to minor charges for matriculation, gymnasium, laboratory materials, and breakages, etc., which rarely amount to more than $50 per year for undergraduates. With the exception of Vermont none of the institutions of this group charges a regular tuition fee to residents of their respective states except in the professional departments, and in a few cases in engineering colleges. The tuition in the Department of Law in the University of Michigan is $55 and $65 per year; in the University of Minnesota, $60; in the University of Wisconsin, free to residents, and to non-residents, $70. In the Department of Medicine the tuition charges are, at Virginia $100, at Illinois $125 to $155, according to the year, and at Minnesota $150. The total revenue from student fees in 1910–1911, excluding board and rental of rooms, exceeded $100,000 in only six of the state universities, — California, Illinois, Michigan, Minnesota, Ohio, and Wisconsin, Michigan leading with $339,000. All of these universities, be it noted, have great professional schools; the University of Washington, with nearly half as many students as Michigan, but with only 277 professional students out of 2142, received from student fees $15,000. In contrast to these figures of the revenues from student fees, should be placed those of Harvard, $651,000, Chicago, $581,000, and Columbia, including the Teachers College and Summer School, $1,164,000.

Total Revenues. — The growth in total revenues from all sources for all the state universities is the most remarkable evidence of their strength and of the stability of their means of support: in 1894–1895 thirty-six institutions received $3,693,000; in 1900–1901 thirty-eight institutions received $6,116,000; in 1910–1911 thirty-nine institutions received $8,690,000. The variation in number of institutions from thirty-six to thirty-nine is due to the addition of three small new institutions which would not much affect the total if they were omitted altogether.

Organization. — In organization, these universities have shown a strongly marked tendency to follow a single type, in which the undergraduate work is still the center of gravity around which revolve the other activities of the institutions. Alongside the college of liberal arts and sciences, or upon the first two years of such college, are placed the colleges or schools of technology or engineering, agriculture, and fine arts; above these and growing out of them by an arrangement more and more commonly recognized and definitely prescribed, are the graduate school and the professional schools, excepting always the school of theology. No American State university has yet gone so far as have some of the provincial English universities, like Bristol, which receive grants from both the imperial treasury and from municipalities, and which give degrees in theology for work done in affiliated theological schools. The University of North Dakota, however, gives credit toward its degree in arts for work done at Wesley College in theological and missionary courses, the latter institution reciprocally recognizing the work of the university and opening its dormitories as well to university students.

The general features of the ideal university toward which these state institutions are striving, not formally and slavishly but with broad sympathy for local and temporary needs, were defined by the National Association of State Universities in a report of its Committee on Standards, adopted in 1908:—

> "We may define a standard American university to be an institution: (1) which requires for admission the completion of the curriculum of a standard American high school with a four years' course . . . ; (2) which offers in the college of literature and science two years of general or liberal work completing or supplementing the work of the high school; (3) which offers a further course of two years so arranged that the student may begin work of university character leading to the bachelor's degree at the end and reaching forward to the continuation of this work in the graduate school or the

> professional school; (4) which offers professional courses, based upon the completion of two years of collegiate work, in law or medicine or engineering; (5) which offers in the graduate school an adequate course leading to the degree of Doctor of Philosophy. . . .
>
> "To be a standard university an institution shall be equipped to give instruction leading to the degree of Doctor of Philosophy in at least five departments, according to the standards prescribed in this report, and shall have at least one university professional or technical school (which shall require) . . . the two years' collegiate training for admission."

The progress of a state university toward this ideal is admirably illustrated by the University of Minnesota, which has always been the sole agency for higher education receiving the support of that state, and whose development has been notably symmetrical, if not so striking and significant in graduate, professional, research, and extension departments as that of the Universities of Michigan, California, and Wisconsin (*qq.v.*).

Relation to Other Institutions. — The relation of the state university to other state-supported institutions and to endowed independent or denominational colleges and universities has not always been either friendly or coöperative. The competition between the university and the agricultural college for students, appropriations, and popular support is frequently inexcusably acute and wasteful, and results in persistence of low standards and duplication of work, as in Alabama and South Dakota. The people of several of the States — Iowa, Mississippi, Virginia, and Oregon — have shown their disapproval of such conditions and have moved in the direction of some central, coördinating body with power to express the unified purpose of the state as a whole, and to compel elimination of waste, friction, and unwholesome rivalry. Such central boards now control higher education in Iowa, Mississippi, Florida, Oklahoma, and South Dakota, though not in every case with progressive effectiveness.

With the independent and denominational institutions the state universities now maintain a better relation than formerly, when it was common in church gatherings to hear the university denounced as "ungodly" and subversive of morality. They have passed from bitter rivalry to sensible coöperation in a work far too great for both combined. Whether the churches will or not, the children of their families go to the state universities in great numbers as well as to the church colleges. The Presbyterian College Board reports 7000 students from Presbyterian homes in fifteen state universities,— more college students than are in all the Presbyterian colleges under the Board. In the face of such facts as these, the Presbyterian, Christian (Disciples), Catholic and other churches have undertaken in several places the religious care of their students in state institutions, which the state itself cannot assume. They have placed student pastors and advisers in charge of handsome buildings erected for the purpose at California, Michigan, Wisconsin, Texas, Kansas, and Missouri. The spirit of coöperation is active also in the direction of the coördination of courses of study so that students who wish to spend two or more years in a small or denominational college may transfer to the university in states like Ohio, Michigan, Illinois, and California, for advanced, professional, or technological work on a definite and assured basis without loss of time.

Outlook. — As an instrument of the state under popular government, standing at the head of a tax-supported system of public education, and responsive to the varying need and the enlarging vision of the State, the future progress of the State university seems assured. It is more likely to suffer from too rapid expansion of function than from restriction; the demand for immediate results, for material evidences of its usefulness, will put it permanently at a disadvantage in certain kinds of idealistic endeavor in contrast with the richly endowed private institutions. But in the large field of higher education in the United States, the state university is already the peer of the older foundation, whether measured by resources, student registration, scholarly standards, or public confidence in its integrity and leadership. K. C. B.

See articles on separate states and state universities, and references there given.

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UNIVERSITIES, ASSOCIATION OF AMERICAN. — An organization formed in 1900 at a meeting held in Chicago in response

STATISTICS OF STATE UNIVERSITIES — 1910-1911.

Name	Location	First Opened	Courses Leading to Degrees[1]: Liberal Arts and Science	Engineering	Agriculture	Architecture	Home Economy	Education	Law	Medicine	Dentistry	Pharmacy	Org. Graduate School	Experiment Station	Summer Sch.	Sch. of Fine Arts	No. of Faculty	No. of Students Exclusive of Summer School	Endowment	Income from State	Income from Federal Government	Total Income (excluding Private Benefaction) including Appropriation for Buildings
Alabama, University of	Tuscaloosa	1831	×	×	—	—	—	×	×	×	—	—	—	—	×	—	61	565	417,015	116,000	—	202,458
Arizona, University of	Tucson	1891	×	×	×	—	—	—	—	—	—	—	—	×	—	—	32	195	10,500	53,550	75,000	137,547
Arkansas, University of	Fayetteville	1892	×	×	×	—	—	—	×	×	—	—	—	×	×	×	131	868	130,000	147,900	62,727	243,408
California, University of	Berkeley	1869	×	×	×	×	—	—	×	×	×	×	×	×	×	×	421	4314	4,538,860	1,012,558	75,000	1,567,810
Colorado, University of	Boulder	1877	×	×	—	—	—	×	×	×	—	×	×	—	×	—	168	1284	60,000	235,000	—	284,000
Florida, University of	Gainesville	1884	×	×	×	—	—	×	×	—	—	—	—	×	—	—	34	241	219,000	90,000	52,500	154,946
Georgia, University of	Athens	1801	×	×	×	—	—	×	×	×	—	×	×	×	—	—	51	537	370,202	105,000	30,000	181,502
Idaho, University of	Moscow	1892	×	×	×	—	×	—	×	—	—	—	—	×	—	×	61	517	772,313	103,000	75,000	239,393
Illinois, University of	Urbana	1868	×	×	×	×	×	×	×	×	×	×	×	×	×	—	615	4896	647,342	1,097,000	75,000	1,560,040
Indiana University	Bloomington	1824	×	—	—	—	—	×	×	×	—	—	×	—	×	—	263	2122	744,000	303,259	—	389,378
Purdue University	Lafayette	1874	×	×	×	—	—	—	—	—	—	×	—	×	—	—	158	1716	340,000	331,837	75,000	582,593
Iowa, State University of	Iowa City	1855	×	×	—	—	—	×	×	×	×	×	×	—	×	×	193	2055	373,344	508,698	—	649,328
Kansas, University of	Lawrence	1866	×	×	—	—	—	×	×	×	—	×	×	—	×	×	139	2178	151,000	544,122	—	602,889
Kentucky, State University of	Lexington	1865	×	×	×	—	—	×	×	—	—	—	—	×	—	—	82	745	144,075	85,938	68,475	172,386
Louisiana State University	Baton Rouge	1860	×	×	×	—	—	×	×	—	—	—	—	×	×	—	80	655	318,313	124,000	51,917	215,458
Maine, University of	Orono	1868	×	×	×	—	×	—	×	—	—	×	×	×	×	—	98	858	218,300	115,688	75,000	266,930
Michigan, University of	Ann Arbor	1841	×	×	—	×	—	—	×	×	×	×	×	—	×	—	491	4754	883,449	659,287	—	1,406,012
Minnesota, University of	Minneapolis	1869	×	×	×	—	×	×	×	×	×	×	×	×	×	—	296	5622	1,448,799	1,470,662	75,000	1,806,800
Mississippi, University of	University	1848	×	×	—	—	—	×	×	×	—	×	—	—	×	—	40	480	—	32,500	—	97,500
Missouri, University of	Columbia	1847	×	×	×	—	—	×	×	×	—	—	×	×	×	—	173	2741	1,264,839	638,330	72,187	853,394
Montana, University of	Missoula	1895	×	×	—	—	—	—	×	—	—	—	—	×	—	—	32	190	950,000	70,000	—	73,015
Nebraska, University of	Lincoln	1871	×	×	×	—	×	×	×	×	—	×	×	×	×	×	333	2839	739,514	480,900	75,000	728,442
Nevada, University of	Reno	1886	×	×	×	—	—	×	—	—	—	—	—	×	×	—	42	311	196,500	176,565	75,000	270,802
New Mexico, University of	Albuquerque	1891	×	×	—	—	—	—	—	—	—	—	—	—	×	—	23	117	—	36,800	—	48,800
North Carolina, University of	Chapel Hill	1795	×	×	—	—	—	—	×	×	—	×	×	—	×	×	56	788	206,237	90,000	—	162,453
North Dakota, University of	Grand Forks	1884	×	×	—	—	—	×	×	×	—	—	—	—	×	—	65	490	1,680,000	175,060	—	290,224
Ohio State University	Columbus	1872	×	×	×	×	×	×	×	—	—	×	×	—	×	—	267	2876	393,319	667,871	45,000	905,861
Ohio University	Athens	1808	×	—	—	—	—	×	—	—	—	—	—	—	×	×	72	811	—	153,569	—	195,994
Miami University	Oxford	1821	×	—	—	—	—	×	—	—	—	—	—	—	×	×	30	353	108,000	147,476	—	193,571
Oklahoma, University of	Norman	1892	×	×	—	—	—	—	×	×	—	×	×	—	×	×	92	707	—	253,495	—	277,744
Oregon, University of	Eugene	1876	×	×	—	—	—	×	×	×	—	—	×	—	×	×	120	920	55,000	125,000	—	141,489
South Carolina, University of	Columbia	1805	×	×	—	—	—	×	×	—	—	—	—	—	—	—	34	416	—	93,263	—	110,725
South Dakota, University of	Vermillion	1882	×	×	—	—	—	—	×	×	—	—	—	—	—	×	54	425	—	112,500	—	139,810
Tennessee, University of	Knoxville	1794	×	×	×	—	×	×	×	×	×	×	×	×	×	—	136	830	409,000	56,715	75,000	226,157
Texas, University of	Austin	1883	×	×	—	—	—	×	×	×	—	×	×	—	×	—	107	1939	2,080,000	295,000	—	483,542
Utah, University of	Salt Lake City	1850	×	×	—	—	—	×	×	×	—	—	—	—	×	—	64	858	—	162,796	—	205,153
Vermont, University of	Burlington	1800	×	×	×	—	—	×	—	×	—	—	—	×	—	—	93	514	999,360	16,000	75,000	195,750
Virginia, University of	Charlottesville	1828	×	×	—	—	—	—	×	×	—	—	×	—	×	—	74	725	1,583,792	80,000	—	241,770
Washington, University of	Seattle	1861	×	×	—	—	—	—	×	—	—	×	×	—	×	×	103	2142	3,000,000	336,661	—	352,228
West Virginia University	Morgantown	1868	×	×	×	—	—	—	×	×	—	—	—	×	×	×	66	544	115,104	138,000	66,000	249,244
Wisconsin, University of	Madison	1848	×	×	×	—	×	—	×	×	—	×	×	×	×	×	486	4099	659,349	1,227,900	75,000	1,744,007
Wyoming, University of	Laramie	1887	×	×	×	—	×	—	—	—	—	—	—	×	×	×	45	242	31,500	62,378	75,000	161,672

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[1] In many of these institutions work is done in education and home economics, but it does not lead to a special degree

to a call signed by the presidents of five universities: Harvard, Columbia, California, Johns Hopkins, and Chicago. These five institutions, together with the following nine others, constituted the original membership: Clark, Cornell, Catholic, Michigan, Pennsylvania, Princeton, Stanford, Wisconsin, and Yale. By later action the following state institutions were admitted to membership, making a total of twenty-two members: Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, and Virginia. No additions have been made since 1909. The condition of membership was at first the maintenance of a strong graduate school, but later the effective organization of high-grade professional schools in connection with the university was made a coördinate prerequisite for membership.

The primary purpose of the Association was the consideration of matters of common interest relating to graduate study. The papers and reports presented at the meetings and published in the proceedings of the Association have generally discussed in a thorough and statesmanlike manner a wide variety of topics, *e.g.* conditions of granting degrees of Ph.D. and A.M.; standards of collegiate, graduate, and professional instruction; promotions in the faculty; safeguarding American degrees abroad, etc. The Association secured from the Prussian and Dutch governments in 1904 recognition of the baccalaureate degrees of its members as the equivalent of the German *testimonium maturitatis*, and the further high privilege of having graduate work done in the institutions represented in the Association, and in these alone, accredited by the University of Berlin toward its degree of Ph.D. The Association has worked steadily and effectively for the definition and improvement of standards in higher education. K. C. B.

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UNIVERSITIES, THE NATIONAL ASSOCIATION OF STATE. — Organized in 1895 for the purpose of promoting "higher education in all its forms in the universities of the several states of the union," and for the discussion of questions and prosecution of plans for rendering the institutions in the Association more efficient. Membership in the Association is confined to colleges or universities founded wholly or in part upon those federal grants of land known as the seminary or university grants (not the land grants of 1862), and to colleges or universities in any state designated and recognized by the state as a state university. Representation with vote is limited to the president or other executive officer, or to his specially appointed proxy. In 1911 forty-two institutions were regular members and ten individuals, formerly presidents, were "special members."

The regular meetings of the Association are held annually at a time and place fixed by the executive committee. They are essentially private, though an annual volume of proceedings is issued. As illustrating the wide range of topics discussed in formal papers and reports of committees, the following are noted: state boards of control, freedom of teaching in state universities, educational standards, fraternities, dormitories, etc. Through important committees the Association has secured advance in the definition and recognition of standards of admission of students, and steady improvement in the requirements for admission to professional schools. Persistence of the Association secured the admission of the state universities to the privileges of the Carnegie Foundation for the Advancement of Teaching and the addition of $5,000,000 to the endowment of the Foundation to enable it to serve the state universities.

The chief function of the Association is in bringing together regularly for intimate, even confidential, conference and discussion the heads of institutions having approximately the same organization, aims, obligations, problems, and form of support by the state. These institutions are directly related to the government and people of forty of the forty-eight states of the Union. Twenty-one of these institutions are also members of the Association of American Agricultural Colleges and Experiment Stations, while twelve (including seven of the twenty-one) are also members of the Association of American Universities.

K. C. B.

Reference: —

The National Association of State Universities, *Transactions and Proceedings.*

UNIVERSITY AND COLLEGE ALUMNI ASSOCIATIONS. — One of the most significant features in the development of American universities and colleges has been the growth of the influence of alumni in the management and control of the institutions. Almost all the colleges of any standing have organized their alumni into effective groups with regularly appointed officers, through whom most of the graduates or former students may be reached. Since the larger and older institutions have alumni clubs in the larger cities, there is always at hand a medium of communication and reciprocal influence of which many presidents annually avail themselves. Through these organizations the college graduates are attaining a constantly growing influence upon the college. The alumni associations help to foster a sense of comradeship, of loyalty to their colleges, and of all the best traditions bound up with these institutions, and at the same time the active support of the alumni can readily be enlisted for the purposes of the college. But, on the other hand, the very effectiveness of these organizations may in the long run prove inimical to the best interests of the universities and colleges. The movement has seldom been associated primarily with scholarly ideals or the promotion of such ideals in the college. The alumni clubs tend to fall into the hands of a few men who are not always the best or most thoughtful of college graduates, and not infrequently many of the members have never graduated at their college. Hence, alumni influence under such leadership is generally exerted in a sentimental or partisan sense. Nowhere has this tendency shown itself more powerful than in the matter of college athletics. In a large number of cases alumni clubs in the desire to secure a winning team have brought pressure to bear on college authorities to tolerate athletic conditions that were not only objectionable but in many cases immoral. The whole question of the influence of organized alumni upon the college is a new problem which resolves itself as follows: What form of participation shall alumni have which shall be fruitful and wise, a participation in which the alumni may have a right to voice their wishes and opinions, a relation nevertheless in which the college authorities shall not be hampered by a merely sentimental effort of alumni to regulate college affairs? While numerous suggestions, some fanciful, some radical, have been offered recently in response to this question, the more conservative advocates of alumni participation go no farther than to suggest the presence of a limited proportion of alumni chosen by alumni associations, on the college board of trustees. And it seems probable that for the present, at any rate, little more than this can be done until alumni organizations begin to show more real devotion to the cause of education and of the intellectual life and a relatively smaller devotion to the promotion of successful athletics or other forms of college aggrandizement. H. S. P.

See COLLEGES, AMERICAN; STUDENT LIFE; UNIVERSITIES, AMERICAN; also ATHLETICS, EDUCATIONAL.

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Carnegie Foundation for the Advancement of Teaching. *Annual Report, 1910–11.* (New York, 1912.)

UNIVERSITY APPOINTMENT BOARDS. — England. — The development of appointment boards or committees in connection with universities in England is recent. Hitherto the intermediary agent between teachers and schools had been either the advertisements of vacancies in newspapers and educational magazines or appointment agencies. The latter have built up a large and flourishing business and become almost indispensable for all but the most highly paid posts in the better schools. The usual charges were a registration fee of from 2*s.* 6*d.* to 5*s.* and a commission of from 5 to 7½ per cent on the first year's salary. While the efficiency of such agencies could not be denied, the justice to those who sought the posts might be questioned. Hence arose the appointment boards at the universities which endeavored to find vacancies in business and professional walks of life at the lowest possible cost to their clients. The earliest of these boards was established at Cambridge in 1902 and is managed by secretary and council of university officials. A similar board was established in 1907 at Oxford, but both registration fee and commission are charged, which, however, are considerably lower than those of professional agents. The universities of Edinburgh, Manchester, and London maintain appointment boards and charge nothing more than a registration fee. They do not confine their work, however, to securing educational appointments alone, but have a much wider field extending to all parts of the Empire. The advantage of university appointment boards over the professional agencies rests on the fact that each applicant is personally recommended by a professor or tutor, and the secretary has an opportunity of knowing his clients personally.

Another important and recent development, also in the interests of the applicant for posts, are the agencies which have been opened by teachers' associations. Of these the most important is the Joint Agency which is managed by a committee representing the Headmasters' Conference, Incorporated Association of Headmasters, College of Preceptors, Teachers' Gild, Incorporated Association of Assistant Masters, Association of Headmasters of Preparatory Schools, Welsh County Schools Association, Association of Technical Institutions, Association of Teachers in Technical Institutes. Thus both headmasters and assistant masters are concerned in the welfare of the agency, which is not run for profit but for the benefit of assistant masters and to secure the best terms for them. A registration fee is charged and a commission of 4 per cent on the first year's salary; but this commission is reduced by half for members of any of the above associations, while an extremely liberal discount is allowed for prompt payment. It is calculated that a saving of $2500 was made last year by the difference between the commissions actually paid and those which would have been paid to the professional agencies. The newer agencies are slowly improving in efficiency and must succeed eventually in doing away with an injustice to the applicants for appointments which those who have been concerned in the filling of vacancies, both headmasters and school committees, have too long supported.

United States. — The Appointment Committee or Appointment Registry is more and more becoming a common feature in American universities and colleges. As a rule these bodies limit themselves in the main to securing educational appointments. Where a special office does not exist for this purpose, the requests for candidates and notices of openings are usually sent to the heads of departments. The special office has, however, the advantage of being a central clearing house and prevents duplication of labor. Thus at Leland Stanford University "the University aims to obtain complete information with regard to the scholarship, experience, present qualifications of each candidate and reports from instructors and others, etc." Besides educational appointments of all kinds, this registry also introduces students into other types of employment — stenographers, secretaries, librarians, bacteriologists, social and playground workers, etc. Similar arrangements are in existence in a number of other institutions, *e.g.* University of Wisconsin, University of California, University of Chicago, Winthrop Normal College, Smith College, Mt. Holyoke College, Simmons College, Harvard University, University of Oregon, Columbia University. As a rule many of the university appointment boards coöperate to a certain extent with the professional agencies, and this coöperation must undoubtedly lead to an improvement in the methods employed by the latter. Several colleges, especially those for women, do not have their own boards, registries, or committees, but work immediately through some recognized agency, *e.g.* Simmons College, Boston, coöperates with the employment department of the Women's Industrial and Educational Union, Boston; Bryn Mawr works largely through a Bureau of Occupations for Trained Women in Philadelphia; Barnard College, Columbia University, coöperates with the Intercollegiate Bureau of Occupations, which is managed by the New York Alumnæ Association of Barnard, Bryn Mawr, Cornell, Mt. Holyoke, Radcliffe, Smith, Vassar, and Wellesley.

See AGENCIES, TEACHERS' EMPLOYMENT.

UNIVERSITY, ATTENDANCE ON. — See COLLEGES AND UNIVERSITIES, ATTENDANCE ON.

UNIVERSITY COLLEGE. — See LONDON, UNIVERSITY OF.

UNIVERSITY COLLEGE, DUBLIN. — See IRELAND, EDUCATION IN.

UNIVERSITY COLLEGE SCHOOL, ENGLAND. — See COLLEGE, ENGLISH; GRAMMAR SCHOOLS; PUBLIC SCHOOLS.

UNIVERSITY EXTENSION. — The term university extension designates a species of educational activity whereby the attempt is made to carry the instruction afforded by the university beyond the premises of the institution and to make it available to persons of all classes so situated that they cannot attend in the university classrooms. This sort of activity has in the process of its development taken on three main forms: (1) lecture study; (2) class study; (3) correspondence study. Lecture study courses have usually been given in groups of six or twelve lectures at weekly or fortnightly intervals. The lecture usually lasts about one hour, and is followed by a class for questions, discussion, and review. The six or twelve lectures usually pertain to one subject, which gives unity to the course. A printed syllabus is furnished to each member of the audience, containing an outline of each lecture, with a list of books for study, questions for review, and topics for written papers. An examination follows. In its ideal, the course is intended to lead to university recognition, precisely as in the cases of instruction given in the university classroom. In practice, however, especially in America as distinguished from England, the number of persons taking these courses for college credit has never been large and has diminished from year to year. On the other hand, the demand for the lectures themselves appears never to have materially abated, since the beginning of this work in America, about 1890. In addition to attending the lectures, a very large number of people have always been disposed to do some of the reading assigned. Attendants upon these lectures have been of all classes, and their purposes have ranged from the pursuit of scientific knowledge, recognizable toward university degrees, to the desire for information upon matters pertaining to citizenship (political science, history, and social science) and even to the wish for mere entertainment and amusement.

Class study is a form of university extension consisting of the organization of college classes elsewhere than upon the college premises, but conducted precisely as in the college classroom. While lecture study courses are organized often even hundreds of miles distant from the seat of the university, the class study groups are usually organized in the same city in which the university is situated, and are intended for teachers and other persons so employed that they cannot attend university exercises at the regularly scheduled periods. The classes, therefore, are organized to meet in late afternoon hours, evenings, and Saturdays.

Correspondence study, as the name implies, is a form of university extension which furnishes instruction to students in any part of the world. The medium is the lesson sheet, giving minute directions as to study. The student sends his work to the instructor who criticizes and returns it. This plan of instruction, whose validity was much in doubt among educators at its beginning, has steadily gained in favor both with the public and with teachers. It is found to lend itself favorably not only to such subjects as philosophy, political economy, history, and sociology, but also to the languages, mathematics, and certain phases of the sciences.

History. — The origin of this form of educational activity is doubtless to be attributed to Professor James Stuart, of the University of Cambridge, England, who, as early as 1866 expressed his ambition to establish "a sort of peripatetic university, the professors of which would circulate among the big towns and thus give a wider opportunity for receiving such teaching." From that time until 1875 he devoted himself assiduously to organizing and starting the movement. It was not until 1873 that he succeeded in inducing the University of Cambridge to adopt the system officially. In the meantime, Professor Stuart had given the first course of lectures organized upon this plan, to companies of ladies in Manchester, Liverpool, Sheffield, and Leeds. His second course was given in November, 1867, to a company of workmen at Crewe. A third course was organized at Rochdale, and it was there that, having left some diagrams suspended in the lecture hall, and finding the workingmen interested in meeting by themselves for the discussion of these diagrams, Professor Stuart organized the "class" as a distinctive feature of this teaching. The story of the beginnings and early development of the movement is vividly told by Professor Stuart in his *Reminiscences* issued in 1911 (pp. 155–177). The London University Extension Society was founded 1876. Oxford University formally organized the work in 1885. Oxford, Cambridge, and London are vigorously prosecuting the work at present (1912). The movement has spread to Australia, Austria Hungary, Belgium, Denmark, Germany, Norway, and Spain.

In America, the university extension movement was first formally recognized in 1890, when there was organized in Philadelphia the American Society for the Extension of University Teaching. This society has continued its work with unabated vigor until the present time (1912). In 1891 the State of New York appropriated $10,000 to be used for organization and supervision of this work. In 1892 the University of Chicago, in its original plan of organization, included provision for university extension of the three types described in the early part of this article. It attached to itself at the very beginning a staff of lecturers, some of them wholly, and others partly, detached from other university work. All the distinctive features which had marked the work in England were adopted, namely, the "course," the syllabus, the review class, the written papers, the examination, and the recognition of the work for university credit. From this center the work expanded enormously, and with the work of the American Society, covered practically the northern half of the States. It is proper to note here that Mr. Richard Green Moulton, of Cambridge, England, was one of the most effective lecturers and apostles of university extension, and his work and influence were powerful factors in the promotion of the work both at Philadelphia and at Chicago. Other central organizations for university extension were formed at Brown University, and the Universities of Cincinnati, Michigan, Minnesota, Iowa, Missouri, Illinois, Kansas, and California, and at Columbia University, in the city of New York.

Aims. — The purpose of the initiators of the movement was entirely serious — to give systematic instruction of an adequate and practical sort to those desiring and needing it, but excluded for whatever reason from the universities. Hence, the provision for the series, in place of the single lecture, reviews and discussions, systematic reading, and examinations. In England this provision appears to have met a real social demand, and from the beginning "student" features have there been prominent. The English university extension lecture courses are of three varieties: (1) sessional (extending through the three terms of the year); (2) terminal (extending through one term); and (3) short courses and pioneer courses. University certificates and diplomas may be secured through either of the first two types of courses, while the purpose of the third is to stimulate interest and to prepare the way for the more serious work of the sessional or terminal courses. Of a still more systematic sort is the work of the "Tutorial Classes." The number of students in a tutorial class is limited to thirty. The students are pledged to attend all the meetings, of which there are at least twenty-four, and at most seventy-two, in the course. Every meeting occupies two hours, one for the lecture, the second for questions and discussions. Weekly or fortnightly essays are written by students. The report issued by the University of London for 1910–1911 shows that for the first term of that year, 3560 persons entered for the sessional lectures and classes, 3163 for the second, and 590 for the third. The report shows a very large number of students working for certificates and diplomas. Many of these tutorial classes are composed entirely of "workmen." Women as well as men are admitted. The age of the students ranges from fifteen to forty-five years. The limits of this article do not permit a more extended discussion of this aspect of the work. The Universities of Cambridge, Oxford, and London, and the English Board of Education issue abundant bulletins on the subject. The aim of this paragraph is to point out the fact that the more serious purposes of the work have been kept emphasized in England in a degree sharply in contrast to what has happened in America (at least so far as university extension lectures are concerned), where interest in the lectures themselves and in the class discussions has always been keen, while the group of "students" doing the paper work and taking the examinations has always been comparatively small, and fewer with successive years. The report of the University Extension Lecture Department of the University of Chicago for 1910–1911 contains the following statistics:—

Number of centers active during the year, 58; number of courses delivered during the year, 93; attendance on lecture courses, during the year, 21,783; average attendance per lecture, 235.

Institutional Results. — To the university extension in England may be traced the foundations of the colleges in Sheffield and Nottingham, and more directly those of Exeter and Colchester, in connection with Cambridge; and the college at Reading to the Oxford University Extension. In the University of Chicago the class study (corresponding to the tutorial classes of London) has developed into the University College, a formally organized department of the University, located in the center of the business district of the city and holding classes for teachers at late afternoon and evening hours, and on Saturdays, offering precisely the same courses, conducted in the same manner, and leading to the same academic results as those within the quadrangles of the University itself. For the year 1911–1912 twenty-three courses were offered in the departments of philosophy, psychology, education, history, home economics, biblical and patristic Greek, Latin, romance, German, English, general literature, mathematics, geology, geography, natural sciences, public speaking, physiology, æsthetic and industrial education.

In all, about fifty colleges and universities in the United States have carried on the work of university extension in some of its forms. The University of Chicago, while continuing the work of the correspondence and class type, withdrew from the lecture study field in June, 1912. This action appears to be justified not so much by a "passing" of the social demand for this kind of activity, as by the judgment of the University administration that other kinds of educational effort have stronger claims upon its resources. The work of the American Society of Philadelphia continues to develop in extent and strength.

Upon the whole, it appears that the university extension movement, as thus far described, inaugurated by the University of Cambridge in 1873, has justified itself, and gives no indications of passing into disuse. It also appears that the social differences in the two countries have caused its development in England to differ somewhat from that in America. In this country, as already pointed out, the lectures are sought for culture and recreation, while those not resident at the university, but seeking university instruction and credits, avail themselves of correspondence study and class study.

The University of Wisconsin has developed a plan of extension work which is appropriate and practicable only in the case of a state-supported university.

It is assumed that "the state university is a public service corporation. It is supported by the people, presumably *for* the people." Provision is therefore made whereby the university is present in the person of representatives in every part of the state. The plan contemplates the division of the state into districts, having "local headquarters" from each of which the various activities of extension shall be promoted within the limits of its territory. The working plant will include administrative offices, classrooms, laboratories, and library facilities. If the leading industry of a district is agricultural, the aim will be to place in that district a man who possesses some special knowledge of agricultural interests; if manufacturing, he should be more or less an engineer; if commercial, he should be acquainted with commercial processes. Obviously, the range of extension activities thus conceived "includes not only such courses as entitle the student to credit at the University, or advanced degrees, or schoolteachers' diplomas, or other such certified recognition, but also short courses and conferences not leading to a degree, and the promotion of a great variety of interests that merge the people, both young and old, in the intimate relations of their daily life."

The plan further contemplates the dissemination of literature intended to acquaint the people in their homes and in their communities with such knowledge as will enable them to improve their conditions, but of a sort hitherto contained in special treatises, and possessed chiefly by experts. "It is not sufficient to determine in the laboratory that coal should be purchased on the basis of the number of heat units in the pound, but this fact must be known to all coal users or buyers, if it is to be of real service." The results obtained by experts or specialists to be of general use must be put into a simple and direct form and brought to the knowledge of the people.

The University of Wisconsin carries on the work of extension in four main departments; correspondence study, lectures, debating and public discussion, and general information and welfare. Before the end of its third year, the correspondence study department showed a registration of 3500 students, about 800 of whom were working for university credits. In the Milwaukee district, in less than two years, one thousand students were enrolled for vocational study. Through the department of general information and welfare, "direct assistance is offered to cities in securing favorable legislation in matters relating to forms of government, street lighting, public sanitation, playgrounds, prevention of abuses, and the many other conditions affecting the health, comfort, and happiness of the people." The University issues in connection with this division of its work a great variety of bulletins relating to the subjects just enumerated.

N. B.

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UNIVERSITY GRADUATES,[1] PROFESSIONAL DISTRIBUTION OF. — The beginnings of the American university as distinguished from the American college are found in the practice of granting degrees of Doctor of Medicine which developed at Columbia and Harvard during the latter part of the eighteenth century. Out of this grew the professional school.

The effect of the development of the professional schools at Harvard may be briefly summed up as follows: The establishment of the medical school led to an appreciable increase, in the early part of the nineteenth century, in the number of graduates who entered medicine. By 1815, for example, medicine took 25 per cent of the graduates of the university as compared with 18.1 per cent of the graduates of the collegiate department for the corresponding period. The increase in the number entering medicine made it the dominant profession for the university between 1815 and 1835, whereas law took a considerably higher percentage in the collegiate department for the corresponding period. After 1815 medicine took a median percentage of 25.2 per cent of the graduates of the whole university as compared with a central tendency of approximately 12 per cent for the collegiate department for the same period.

Harvard law school was founded in the second decade of the century. This caused an immediate and rapid rise in the curve for law so that for 1841–1845, 44.4 per cent of the graduates of the university entered law as compared with 35.8 per cent for the collegiate department. From this time until 1875 law took from 4 to 6 per cent more of the graduates of the university than of the collegiate department. After 1875, however, the development of other professional schools, together with the rise in the standards of the law school, resulted in approximately the same percentages for this profession, both in the whole university and in the collegiate department.

A comparison of the curves representing ministry, for the collegiate department and for the whole university respectively, shows a very great resemblance in general form, due to the fact that the majority of the students in the divinity school have been graduates of Harvard. The curve for the whole university, however, tends to run somewhat lower than that for the collegiate department, inasmuch as the number of divinity students not holding previous degrees from Harvard is not sufficiently large to offset the larger totals involved. At the time of the founding of the divinity school, ministry took about 15 per cent of the graduates, whereas for the years 1901, 1902, 1904, and 1905, but 2.2 per cent of the graduates of the university entered ministry.

The general shape of the curves representing commercial pursuits is quite similar in both the collegiate department and the whole university, although the latter is somewhat depressed during the later years. This similarity is quite naturally explained by the fact that none of the professional schools have heretofore prepared directly for this field, and it has accordingly drawn the larger number of its men from the collegiate department. The group now represents nearly a third of the graduates of the collegiate department and nearly one fifth of the graduates of the university.

The percentage of those entering the profession of teaching is of course lower when the university as a whole is considered than when the collegiate department only is taken into account. The general shape of the curves, together with their variations, however, is quite similar, although that of the university runs somewhat lower. For example, the average percentage for the university between the years 1850 and 1875 is 8 per cent as contrasted with 10.9 per cent for the collegiate department during the same period, and for the period 1875 to 1900, that for the university is 13.6 per cent as contrasted with 16.8 per cent for the collegiate department. The maximum percentage for the whole university is 16.2 per cent; that for the collegiate department, 20.4 per cent. These results are to be expected, inasmuch as such special preparation as is offered for teaching is offered as a part of the collegiate department.

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[1] See COLLEGE GRADUATES, PROFESSIONAL DISTRIBUTION OF, which deals with the distribution of college graduates and the graduates of the collegiate departments of universities. The discussion above deals only with graduates of universities having professional schools and covers only the period of time subsequent to the establishment of professional schools in the history of such universities. For the period covered by the discussion, however, it deals with all of the graduates of the universities including the graduates of their collegiate departments.

The percentages for the minor professions are somewhat lower in the statistics for the university as a whole than in those for the collegiate department, indicating that these professions draw a relatively small number of men from the professional schools.

A comparison of the total number entering the professions from the whole university with that from the collegiate department is shown by the following table: —

HARVARD UNIVERSITY[1]

Collegiate Department		Whole University	
	No. of graduates		*No. of graduates*
Lawyers	4117	Lawyers	6805
Commercial pursuits	3957	Physicians	5118
Ministers . . .	2203	Commercial pursuits	3672
Educators . . .	2144	Ministers	2410
Physicians . . .	1958	Educators	2276
Public service . .	464	Public Service . . .	498
Literature and journalism . .	453	Dentists	446
Engineers . . .	279	Literature and journalism . . .	431
Farmers	223	Engineers	341
		Farmers	241
		Veterinarians . . .	110

A brief comparison with Yale University shows that the curve representing law did not rise so precipitately at Yale after the founding of its law school as it did at Harvard, nor did it suffer such a subsequent decline, but is fairly constant about a central tendency of approximately 30 per cent. At Columbia the founding of the law school caused the law curve to rise to 53 per cent for 1871–1875, a point higher by nearly 10 per cent than the highest percentage for Harvard and nearly 20 per cent higher than any at Yale. At the close of the century, however, law took about 25 per cent of the graduates of each of these institutions. At the University of Michigan the law school made law by far the dominant profession, and it has taken an average of nearly 40 per cent of the graduates. At the University of Wisconsin the law curve for the whole university declined from 50 per cent to less than 20 per cent. It was the dominant profession at this institution until 1895.

The development of the medical school at Harvard resulted in a much higher percentage for medicine than at Yale. The curve for Yale declined from 25 per cent to less than 10 per cent during the last three quarters of the nineteenth century, whereas the curve for Harvard maintained a general average of approximately 25 per cent until 1890 and at the close of the century was but a little below 20 per cent. At Columbia University the development of the medical school resulted in making medicine the dominant profession and it has taken an average of approximately 40 per cent of all the graduates of the university since 1865. The rapid development of the medical school at the University of Pennsylvania, and the relatively large number of graduates dwarfed all the other professions as compared with it. Between 1810 and 1870 it took approximately 90 per cent of all the graduates. The gradual development of law and engineering at the University of Pennsylvania and the rise in standards in the medical school resulted in lowering this percentage to 40 per cent at the close of the century. At Dartmouth the growth of the medical school resulted in about one third of the graduates of the institution entering medicine after 1815. At the University of Michigan the rapid rise in law and other professions caused a decline in medicine from 60 per cent to 15 per cent. At the University of Wisconsin medicine has taken only about 6 per cent of the graduates.

The curves for ministry are somewhat similar at Harvard and Yale, in that they both represent a rapid decline. Harvard's curve, however, is from 5 to 10 per cent lower throughout the nineteenth century. At Columbia the curve for ministry has been below 3 per cent since the founding of the law school and the development of the medical school. At the University of Pennsylvania the curve has been below 3 per cent throughout the nineteenth century. It never was above 10 per cent at the University of Michigan and since 1865 has been below 3 per cent. It also never exceeded 10 per cent at the University of Wisconsin and since 1875 has been below 5 per cent.

The rise in commercial pursuits at Yale University has been more conspicuous than at Harvard. At Yale the rise has been from 3 per cent in 1833–1834 to 33 per cent at the close of the century, whereas the curve for Harvard rises from 4 per cent in 1840 to 21 per cent at the close of the century. The very rapid development of the medical and law schools at Columbia caused a decline in all other curves except engineering after 1860. Before this time commercial pursuits took from 10 to 20 per cent of the graduates, but since then have taken approximately 5 per cent. The dominance of medicine at the University of Pennsylvania has kept the curve for commercial pursuits below 5 per cent. At the University of Michigan the curve for commercial pursuits ranges between 5 per cent and 10 per cent between 1860 and 1900, with its maximum in 1880. The curve for this group at the University of Wisconsin rose to 20 per cent, but declined to 13 per cent at the close of the century.

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[1] The totals for the whole university are somewhat smaller than they should be, as the data for the whole university are not brought down to quite so recent a date as those for the collegiate department. For purposes of showing the relative order of professions, however, the data are sufficiently accurate.

Education took approximately 10 per cent of the whole number of graduates at Yale University during the last three quarters of the nineteenth century. At Harvard, on the other hand, the curve for education averaged about 7 per cent until 1870. By 1895 it had risen to 15 per cent, but declined 5 per cent during the next five years. At Columbia University the curve for education does not rise above 5 per cent. At the University of Pennsylvania it does not rise above 2 per cent during the nineteenth century. It rises steadily at the University of Wisconsin from the time of the founding of the university and takes about 18 per cent of the graduates at the close of the century. The rise of this curve at the University of Michigan is even more conspicuous, and at the beginning of the twentieth century about one third of the graduates of the University of Michigan entered the profession of education.

The comparison of the distribution of the total number of graduates of universities including professional schools is not as satisfactory as a similar comparison of the distribution of the graduates of colleges and the collegiate departments of universities (see College Graduates, Professional Distribution of) because the standards prevailing in professional schools are less uniform than those prevailing in colleges and collegiate departments. B. B. B.

UNIVERSITY HOODS. — See Academic Costume.

UNIVERSITY, NATIONAL. — See National University.

UNIVERSITY SCHOOLS OF COMMERCE. — See Commercial Education.

UNIVERSITY SESSIONS, CONTINUOUS. — See Chicago, University of; Summer Schools and Continuous Sessions.

UNIVERSITY STAFFS, COMPOSITION OF. — The growing complexity of the modern American university is nowhere more marked than in the organization of the instructing staff. Harvard College in the year 1650 had a staff consisting of a president and two tutors; at Columbia University for the year 1909-1910 the instructing staff numbered 622, under 20 different academic titles, and this classification does not include the 25 administrative officers ranking from president down.

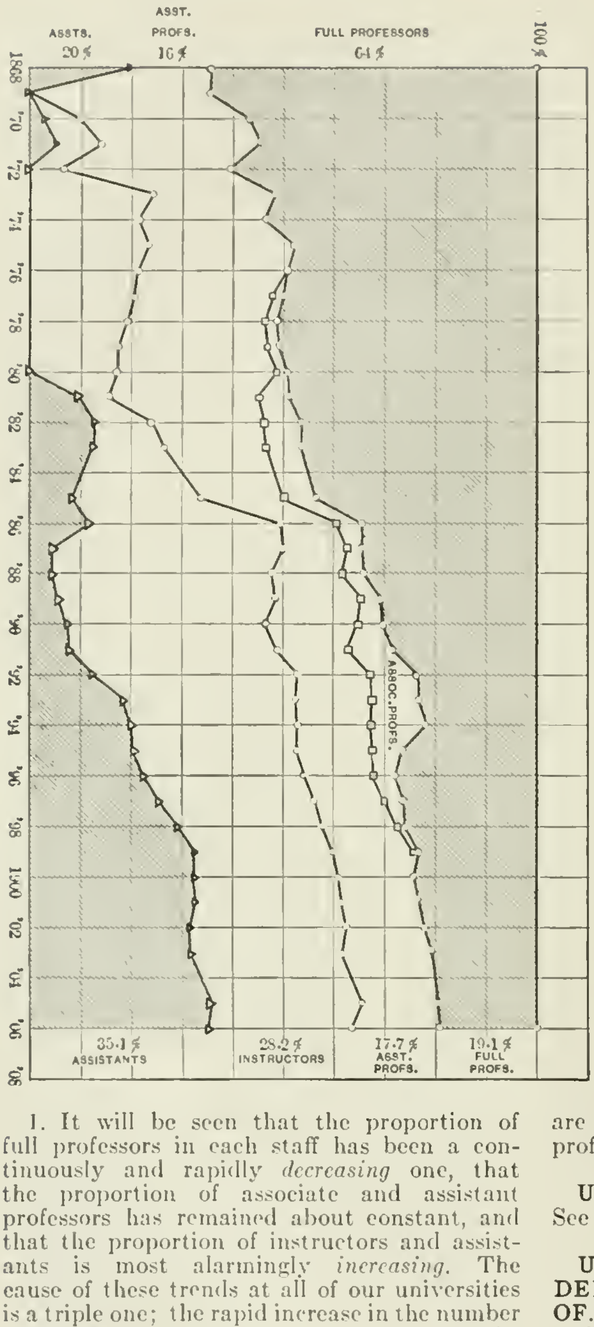
Entirely apart from the business and clerical employees, the library staff and that of the recorder's or registrar's office, the college or university teaching organization of to-day is elaborately differentiated, and the number of ranks often effectively doubled by a system of "acting" or "honorary" members of each rank corresponding, in a way, to military brevet appointments. They carry the duties but not the salary of the position. An idea of the variety of academic positions is conveyed by the following list of officers commonly constituting an instructing staff of a modern university: —

President (occasionally termed Chancellor or Provost); Vice President; Dean of the Faculty (Graduate, or Undergraduate, or both); Dean or Director of College; Senior or Head Professor (Executive Head of Department); Professor; Professorial Lecturer (as at Chicago); Junior Professor (Michigan), or Adjunct Professor (Columbia), or Associate Professor (California, etc.); Assistant Professor, or Adjunct Professor (Virginia); Associate (as at Johns Hopkins); Instructor; Annual Instructor (as at Harvard); Associate (as at Chicago); Assistant; Teaching Fellow; Clinical Professor (of various ranks); Clinical Lecturer; Clinical Chief; Clinical Instructor; Clinical Demonstrator; Clinical Assistant; Astronomers of various ranks; Lecturers, regular and special; Superintendents of Farms, or Shops; Foremen of Farms, or Shops; Curators. And even this list is necessarily incomplete.

Roughly, however, the members of the teaching staff may be classified as full professors, associate professors, assistant professors, instructors, and assistants; and, classifying them in this way, the rapid growth of the student body has wrought great changes in the nature and composition of the teaching staff at every institution. The effect upon all institutions studied has been a similar one and, as it can be shown best graphically, a typical chart showing the composition of the Cornell University staff at Ithaca, year by year since its foundation, is given on page 690.

The table on page 691 gives data further illustrating this movement.

The trends here disclosed should be studied with reference to two items: first, the effect on the efficiency of the institution; and second, with respect to the possibilities of university teaching as a profession. In other words, first with respect to the *institution*, and, second, with respect to the *staff*.



1. It will be seen that the proportion of full professors in each staff has been a continuously and rapidly *decreasing* one, that the proportion of associate and assistant professors has remained about constant, and that the proportion of instructors and assistants is most alarmingly *increasing*. The cause of these trends at all of our universities is a triple one; the rapid increase in the number of students for whom instruction is to be provided, the failure of the incomes of the institutions to keep proportionate step, and a deplorable rivalry in bigness and externalism leading to unwise and unnecessary expenditures for buildings and equipment. It certainly means one thing as regards efficiency — a greater and greater share of the instruction falls upon the shoulders of the body of less experienced men, and the student has a decreasing chance of working with men who have attained eminence in his line. Those who believe that the influence of personality is one of the most vital elements in training must give serious thought to the effect of trends which separate, more and more widely, the student from intimate contact with men who have won recognition for success in his field of study.

Another item vitally affecting the efficiency of instruction is that this large number of instructors and assistants (from 50 per cent to 65 per cent of the staff) consists of men on temporary appointments, so that it is no unusual thing for one half of them to be entirely new appointees at the beginning of each year. The question naturally arises, what can be the sole effect on the efficiency of a staff which annually loses a large proportion of somewhat trained and experienced men, whose places must be filled by beginners who must familiarize themselves with their new duties and be trained up to adequacy?

2. As regards the effect of these trends on the opportunities offered by university teaching as a profession, it need only be said that a man in the lower grades has just one third the chance of winning a place in a 20 per cent group that he had of winning one in a 60 per cent group. A study of the increasing average age in the ranks of associate and assistant professors at our universities bears this out.

At present the full professors form but a small and rapidly diminishing proportion of our entire teaching staffs — a fact which seems to have escaped general recognition. While in 1885 (at the beginning of the great upward wave of attendance) there was one full professor to from fifteen to thirty students, there are now forty to eighty students per full professor. G. H. M.

UNIVERSITY SUMMER SCHOOL. — See Summer School.

UNIVERSITY TEACHERS AND STUDENTS, INTERNATIONAL MOVEMENT OF. — The international movement of teachers and students has steadily gained in proportions and significance during the last fifty years, approaching in relative magnitude the similar movement in the Middle Ages when the use of Latin as the language of scholarship and literature made possible the gathering of students from all parts of Europe at the universities of Paris, Bologna, and Salamanca. The present-day forces operating to draw, or drive, students to seek far-separated masters and widely dis-

TABLE
PROPORTIONATE COMPOSITION OF STAFF

	ASSISTANT PROF'S. IN STAFF							STAFF ABOVE ASSIST. PROFESSOR							STAFF BELOW ASS'T. PROFESSOR						
	YR.	%	YR.	%	YR.	%		YR.	%	YR.	%	YR.	%		YR.	%	YR.	%	YR.	%	
CALIFORNIA	'87	5.4			'07	28.4		'87	44.8			'07	26.8		'87	50			'07	46.8	ASSOC. AND FULL ABOVE
CHICAGO			'00	14.7	'08	14.1				'00	36.9	'08	39.5				'00	49.4	'08	46	" " " " } ALSO PROFESSORIAL LECTURERS
COLUMBIA	89	6.1	'00	4.3	'09	10.7		'89	15.7	'00	20.5	'09	27.7		'89	77.2	'00	75.3	'09	61.6	ADJUNCT PROFS. PROBABLY MORE LEGITIMATE TO TAKE "ASSOCIATES"
CORNELL	'89	14.5			'09	17.1		'89	35			'09	18.2		'89	48.5			'09	64.7	
HARVARD	'89	15.9	'00	12.2	'04	13.7		'89	37.3	'00	23.2	'04	23.8		'89	47.5	'00	64.1	'04	62.5	A FEW ASSOCIATES
INDIANA	'89	0	'00	28.8				'89	85.2	'00	40.2				'89	14.8	'00	36			ASSOC. AND FULL ABOVE
IOWA	'89	7.	'00	9.				'89	69.6	'00	53.9				'89	23.4	'00	37.1			
JOHNS HOPKINS	'89	20.8	'00	20.7	'08	18.5		'89	56.4	'00	45	'08	46		'89	22.8	'00	34.3	'08	35.5	CALLED "ASSOCIATES" ASSOC. AND FULL ABOVE
KANSAS			'00	28.4	'09	25.2				'00	56.7	'09	42.5				'00	16.9	'09	32.8	ASSOC. AND FULL ABOVE
LELAND STANFORD JR.	'91	16.6			'09	16.2		'91	46.9			'09	35.3		'91	37.5			'09	46.8	" " " "
MINNESOTA	'89	11.1	'00	6.7				'89	66.7	'00	30.6				'89	22.2	'00	60.3			" " " "
MISSOURI	'89	22.6	'00	16				'89	57.7	'00	65.7				'89	9.7	'00	18.3			" " " "
WISCONSIN	'89	11.6	'00	22	'07	15		'89	75.1	'00	34.8	'07	26.4		'89	16.4	'00	48.4	'07	58.6	" " " "
YALE	'88	4.3	'00	7.7	'09	18.4		'89	46.5	'00	35.6	'09	27.6		'89	47.2	'00	56.7	'09	54.2	

tributed opportunities, and to overcome the barriers of alien speech and of distance, are a keen common interest in science and its applications; the extension of scientific principles and methods to history, politics, economics, society, ethnology, religion, and archæology; safety, ease, and expedition in traveling; and a general softening of international animosities and prejudices. Political repression of university freedom in the Russian and Turkish Empires sends thousands of students annually to the universities of Germany, France, and Switzerland; the awakening of the Orient was followed by the appearance in Occidental institutions of scores and then hundreds of students from Japan, China, Korea, and the Philippines. No small part of the reformatory and revolutionary movements in these countries can be traced directly to the influence of these foreign-educated students. In the University of Paris, in 1911, 3267 out of 13,971 students were foreign; of the 5380 foreign students in all the French universities or " supérieur " institutions, Russia sent 2569, Turkey 313, Bulgaria 319, Egypt 294, and America 35.

At the same time, the twenty-one German universities had 4524 foreign students in a total of 57,200, of whom Russia furnished 2044, Asia 176, and America 272. At the University of Oxford since 1904 there have been the foreign Rhodes Scholars, numbering now about 180 (present possible maximum 189), holding three years' appointments on stipends of £300 from the Rhodes Scholarship Trust; in 1910–1911, 89 were from the United States, 77 were from the British colonies, and 10 were from Germany.

Two American universities having in 1910–1911 large numbers of foreign students were Columbia University and the University of Pennsylvania. Nearly 4 per cent of Columbia's registration of 5893 (including the summer session) were foreign, among them being 53 from Canada, 39 from China, and 27 from Japan. In the University of Pennsylvania in a total registration of 5385 there were 263 foreign students, including 45 from South America, 38 from the West Indies, 26 from Australia and New Zealand, and 24 from China.

At the request of the Minister of Public Instruction of Prussia, the president of the Carnegie Foundation for the Advancement of Teaching, in 1907 consented to act as the agency in America for an annual exchange of teachers in gymnasiums and high schools and colleges, without stipulation as to the number. In each case the exchange teacher spends a year in a single school, teaching his own language informally, as a supplementary instructor and not as a substitute for a regular instructor. The numbers of teachers so exchanged are: 1907–1908, 7 Germans in the United States, and 8 Americans in Prussia; 1908–1909, 6 and 9; 1909–1910, 11 and 8; 1910–1911, 7 and 9.

The groups of figures for the American universities serve to illustrate the tendency to reverse the current of students' which flowed steadily from America towards the European universities before the great graduate schools and professional schools at Harvard, Columbia, Cornell, Chicago, Wisconsin, and California grew into a real rivalry, as centers of productive scholarship and research, with the universities of the Old World. The number of American students in German universities during each winter semester fluctuates between 250 and 300. Naturally the number of professors called from Europe to fill chairs in American universities has, first and last, been large, and the number called in the opposite direction small. Notable cases of distinguished men from Great Britain and from Germany, accepting permanent appointments in the United States, are to be found in the later history of Harvard, Massachusetts Institute of Technology, Cornell, Chicago, Princeton, and Union Theological Seminary.

Definite and permanent organization of the international exchange of professors, annually or biennially, either for a whole year or for a stated period, began in 1897 with the gift of $30,000 to the *Cercle Française* of Harvard University to endow an annual lectureship in Cambridge, to be filled by distinguished French scholars and publicists. By a fortunate custom this lecturer usually gives lectures at other centers as well as at Cambridge. In 1904 an agreement for an annual exchange of professors for approximately a half year was entered into by Harvard University and the University of Berlin, and seven such exchanges have been made. Harvard has also a similar arrangement for biennial exchange with the Sorbonne through the French Ministry of Public Instruction, first effective in 1911.

Another permanent exchange was arranged in 1906 between Columbia University and the University of Berlin. At the former the Kaiser Wilhelm Professorship of German History and Institutions is annually filled on the nomination of the Prussian Ministry of Education; at the latter the Theodore Roosevelt Professorship of American History and Institutions, endowed with $50,000, is filled on the nomination of Columbia. Six exchanges have been made on this foundation.

The Scandinavian-American Society started the first of a series of exchanges with the North European countries, but without so definite a schedule as those just mentioned. In 1910 the Society received a gift of $100,000, and will later receive as legatee a still larger sum, for encouragement of educational intercourse. The organization was chartered in 1911 as the Scandinavian-American Foundation.

Through the agreement of the Carnegie Peace Endowment with the Japanese government, the former is to send to Japan in alternate years beginning in 1912–1913, a distinguished American representative of scholarship or public life, to spend six or eight months and to receive from the endowment an honorarium of $5000, and the latter is to send in alternate years a scholar, scientist, or man of affairs, to spend a like period and to be paid by the Japanese government. The program of the Japanese lecturer in 1911–1912, which may be changed year by year, included public lectures and addresses as well as formal lectures at six universities: Brown, Columbia, Johns Hopkins, Illinois, Minnesota, and Virginia.

Somewhat less formal and exact interchange of services exists between the University of Göttingen on the one hand and the University of Chicago and the Germanistic Society of Chicago on the other. Coöperative work in astronomy is carried on by the universities of Michigan and La Plata through the appointment of the same man as director of the observatories of the two institutions. K. C. B.

See Rhodes Scholarships.

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UNIVERSITY TUTORIAL CLASSES. — See Workers' Educational Association.

UPDIKE, WILKINS (1784–1859). — One of the founders of the Rhode Island public school system. He received his education in the district schools and at an academy at Plainfield, Conn. Although engaged in public life, he devoted much time to educational matters and was one of the founders of the Rhode Island Institute of Instruction.

W. S. M.

UPPER IOWA UNIVERSITY, FAYETTE, IOWA. — Organized in 1854 as Fayette Seminary, under the Iowa Conference of the Methodist Episcopal Church. In 1858 the incorporation changed its form to that of Upper Iowa University. The work since the first has been organized into an academy and the College of Liberal Arts. In 1867 the commercial school was appended which later was changed into the department of commerce of the Academy. Departments of music, elocution and oratory, and painting were later added as allied departments of the college. The college campus covers ten acres of ground and is the site of the seven buildings of the college. The college has an endowment fund of $242,000. The entrance requirements are fifteen units. The college of Liberal Arts has eleven separate departments, with a teaching staff of twenty. The registration for 1910–1911 was three hundred and sixty-five.

R. W. C.

UPPER SENEGAL. — See French Colonies, Education in.

UPPINGHAM SCHOOL, ENGLAND. — See Grammar Schools; Public Schools.

UPSALA COLLEGE, KENILWORTH, N.J. — See Lutheran Church and Education.

UPSALA, UNIVERSITY OF, SWEDEN. — Permission was obtained to found a university at Upsala by King Eric XIII in 1419, but no action was taken until 1477 when Archbishop Ulfsson and the bishops and clergy of Sweden obtained a bull from Sixtus IV to establish a *studium generale* on the model of Bologna. The university privileges were granted by the Archbishop and Sten Sture, the Regent of Sweden. It is probable that the neighboring German universities, *e.g.* Cologne and Rostock, were taken as direct models rather than Bologna. The institution did not, however, meet with success; in the sixteenth century it was torn by religious disputes and was closed in 1588. On the establishment of Protestantism, the University was reopened in 1595 with faculties of theology and philosophy. Its real progress dates from the time of Gustavus Adolphus, who furnished it with a library and endowments. A new constitution, which was drawn up in 1655 and was in force until 1852, practically made the University entirely autonomous. The most famous alumni and teachers connected with the University have been Linnæus (1707–1778), the botanist; and Eric Gustav Geijer (1783–1847), historian, philosopher, poet, and musician. The university library contains the only extant manuscript of Ulfilas' translation of the Bible. The present organization dates from 1852. There are now maintained the following faculties: theology; law; medicine; philosophy with (*a*) section in humanities, and (*b*) section in mathematics and science. The building dates in large part from the seventeenth century, but among recent additions are the Chemicum (1904) and Physicum (1908). The students are organized into "nations" according to the provinces from which they are drawn. The "nations" have their own houses and organizations for social purposes, and may be compared with the American fraternities. The enrollment in 1901 was 2261, more than 1400 students being in the faculty of philosophy.

See Sweden, Education in.

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URINALS. — See Latrines.

URSULINES. — See Convent Schools; Teaching Orders of the Catholic Church.

URUGUAY, EDUCATION IN. — **General Conditions and History.** — The Republic of Uruguay (Republic Oriental del Uruguay) is the smallest of the independent nations of South America, its area being less than 73,000 square miles; the population, as estimated in December, 1910, was 1,112,000 of which a large proportion, nearly one third, was concentrated in the department of Montevideo. Of the entire population about 200,000 are immigrants of various European nationalities; the 900,000 remainder are native Spaniards and Indians.

The Spaniards landed on the shores as early as 1515 and formally took possession of the country in the name of the King of Spain, but the indomitable courage of the natives prevented any extensive colonization, and it was not until 1624 that the first of the present centers of population was founded. The country was claimed as part of the Spanish Viceroyalty of Rio de la Plata and subsequently was a province of Brazil. In 1828 after obstinate struggles independence was achieved; there followed a period of internal strife which ended in 1875, since which time the country has enjoyed repose and has made great social and industrial progress.

The first school in this territory of which there is record was established at Montevideo by the Franciscans in 1744; the Jesuits soon after opened a college which was maintained until their expulsion from the country in 1767. In 1795 a school for girls was established by a woman of distinguished family.

The first movement toward popular education was made by the Lancasterian society which was founded in 1821, and which not only excited public interest by discussion and publications but opened a free school for boys. A grammar of the Spanish language prepared by the director of this school, Señor José Catala y Codina, was used in the public schools of Uruguay down to 1850.

Soon after independence was achieved, the republican government (May 16, 1827) ordered the establishment of a school in the chief places of each department and at the same time appointed a central board of school inspectors. The practical results of this early measure were few, and in 1847 the *Institute of Public Instruction* was organized to develop the work. This body issued general directions for the control of the state schools, for the selection and appointment of teachers, and the choice of textbooks. Under this impetus schools multiplied for a while, but gradually declined from want of resources. The civil and foreign wars of 1863–1864 put an end to progress. The revival of the interest was due to Señor José Pedro Varela, inspector of the schools of Montevideo, who in 1868 organized a society of popular education which heartily supported his efforts. The draft of an education law prepared by Señor Varela was successfully carried through the legislature in 1877 and is the basis of the present system of primary instruction.

Present System. — The central control of primary education is vested in a national inspector who is assisted by a small advisory council, forming at present a division in the ministry of industry and public instruction. In each of the civil departments of the country there is an education commission and a departmental inspector charged with the direction of primary schools and reporting annually to the central authority. Two normal schools are maintained at Montevideo, one for men, the other for women, and the law requires that a primary school shall be established in every community having fifty children of school age. Three grades of primary schools, elementary, intermediate, and higher, are recognized; the program of studies is extensive, including besides the three elementary branches, drawing, composition, grammar, and rhetoric, geography and history (especially of Uruguay), civics, ethics and religion, bookkeeping, algebra, and geometry, elements of physiology, hygiene, natural history, and agriculture, gymnastics, and singing. In the schools for girls cutting and sewing (hand and machine) are included. It was not expected that this elaborate program should be generally adopted; but simply that the law should authorize studies of a high school grade wherever local support was adequate for such a course.

Notwithstanding the liberal conception of primary or popular education embodied in the law, the interest languished until a very recent time. The government inspector of schools, Dr. Abel J. Perez, in his report for 1906, notes a marked advance in this respect, indicated in particular by the education bills receiving support in the legislature. Since that year there has been decided progress in the provision and conduct of public schools. This is shown by appropriations enabling selected teachers to study modern methods in foreign countries; by the improvement and extension of the normal school training, and by government appropriations to aid communities in building and equipping schoolhouses.

The law of 1877 authorized compulsory education wherever the conditions made this possible, but little attention has been paid to this clause. During the present session a bill was presented to the legislature by the Departmental Committee of Montevideo and endorsed by the municipal board of education, providing for compulsory education in that department; the measure commands strong support and its passage seems assured. Measures have also been taken for the establishment of a special school for backward children, the organization of school hygiene, and the medical inspection of schools. Under the direction of the chief inspector the departmental inspection of schools is vigorously maintained. The location and value of every school building, and the professional status of every teacher, are now annually reported, and decided advance has been made in both respects during the last half decade. In 1906 there were 619 public schools enrolling 57,638 pupils; in 1910 the number of public schools was 793 and the enrollment 74,717. This number was equivalent to 34 per cent of the school population estimated at 218,938 children 6 to 14 years of age. The number of pupils in the 300 private schools, *i.e.* 20,443, brings the total enrollment to 95,160 or 43 per cent of the school population. The new school buildings for which provision was made in 1910 were intended to accommodate 20,000 additional pupils. The public schools are all under government inspection and naturally reach higher efficiency than the uninspected private schools. The latter are found chiefly in the cities, and are largely directed by the religious orders. Of the public schools 662 out of a total of 793 reported were rural; the latter are, however, generally small ungraded schools, and their total enrollment was only 28,808 as against 45,909 in the urban schools. The teaching force of the public schools numbered 1502, of whom 199 were men, 1403 women. The general average of salaries was, for men, $47.61 a month; for women, $40.76. Of the men teachers, all but twenty-five had either state or normal school diplomas, and of the women teachers, all but 160.

The expenditure for public schools in 1910 reached the sum of $1,119,067.72, which was equivalent to $14.94 per capita of enrollment and to $20.68 per capita of average attendance. The general government meets above one third of the expense, and departmental resources the remainder.

The department of Montevideo supplies nearly one third of the pupils in all public schools, 23,041 of the 74,777 reported in 1910. The schools of the city are graded, and include infant and higher primary schools, and also evening schools for adults. Montevideo has taken the lead in provision for vocational training, the latest addition to its facilities being an industrial school organized by a private citizen, in which women are taught dressmaking, millinery, embroidery, and other feminine accomplishments. The school will be free of expense to the pupils, the founder having given the building and provided teachers and all necessary appliances.

Evening classes for adults which are found in all the cities were attended in 1910 by 2321 pupils. There were also 3188 children under the charge of the national board of charities, and 2280 military recruits receiving instruction. These particulars show the purpose of making elementary education universal in the republic.

The secondary schools of the country are chiefly private, and their courses of instruction and standards are regulated by the requirements for admission to the university, the military school, and the theological seminaries.

The University of Montevideo comprises faculties of law and social science, medicine and mathematics, a school of commerce, a veterinary school and clinical institute and laboratories. The university preparatory school is the highest school of secondary grade in the republic. At Montevideo there are also a school of arts and trades providing for about 180 students, and a military college registering forty-six students, both supported by the state.

The facilities for education at the capital include the National Library comprising 47,500 volumes and nearly 10,000 manuscripts, and the National Museum. The latter comprises a pedagogical museum and library of great value to teachers.

Uruguay is essentially an agricultural country, and a Rural Association has been organized which among other activities seeks to promote agricultural education. In factory centers provision is being made for technical education, and sanitary regulations are rapidly being enforced in populous centers. A. T. S.

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USAGE, IN LANGUAGE. — See English Usage.

USHER. — The usual term for a second or assistant master in a school till the later part of the eighteenth century. It is a corruption of the word *Ostiarius*, a doorkeeper, appearing very often with an H prefixed, notably in the title of the second master of Winchester College, in the Statutes made by William of Wykeham in 1400, probably repeating those of 1382. *Ostiarius* is not classical Latin for doorkeeper, *janitor* being the word in use. The Ostiarius was the last but one of the seven orders recognized in the early church, ranking next after subdeacon. When or how the doorkeeper passed into an educational officer, or whether the name was merely imposed on the assistant master by way of analogy, has not yet been ascertained. The earliest name for an assistant master appears to have been vice-monitor, which is the title used in the thirteenth century statutes, *c.* 1274, for grammar schools at Oxford, which were already said to be antiquated; in the statutes of St. Alban's School in 1310; and in the school documents at Canterbury in 1314 and 1321. The earliest instance of the use of the word ostiarius instead of vice-monitor is in the accounts for the year 1300 of the grammar school attached to Merton College, Oxford, when one half-penny was paid for the "dica" or fee of the usher for one term as against 4*d.* paid for "scholage" (*scolagio*), being the fee of the master.

In the statutes of St. Alban's Grammar School made in 1309 we meet with an usher (*Hostiarius*) and vice-monitor and an under-usher, and it is somewhat difficult to make out their exact positions. At Canterbury School in 1311 the ostiarius is a pupil teacher but appears to be holding the same office as one who is called vice-monitor in 1314. For one Richard Hall was on December 17, 1311, excommunicated by the master for an assault on John the Plumber, his usher and scholar (*ostiarius nostri et scolaris*). The common law as well as the ecclesiastical courts and a jury of clerics and laymen found that the schoolmaster by ancient custom summoned delinquents by his usher (*ostiarius*) to appear in his court, the school. In 1314 a scholar of the school was summoned for hindering the vice-monitor and his scholars from their public teaching and violently assaulting Master Walter, the vice-monitor, whose title shows he was already an M.A. In a subsequent case against the rival school in St. Martin's, Canterbury, a jury found that the schoolmaster of St. Martin's was limited by ancient custom to thirteen grammar scholars and the master of Canterbury School had the right of visitation in person or by deputy to see that the custom was observed. When the usher or under-monitor (*Hostiarius submonitor*) of Canterbury School thus visited for the master, the scholars of St. Martin's used to hide themselves so as to leave only the lawful number of thirteen visible, and this was established as part of the ancient custom, *i.e.* at least sixty years old. The records of this school seem to show that the usher was a good deal older than our first acquaintance with him in the Merton records. In those records in 1347 and 1348 we find the assistant of Master John of Cornwall, the master who introduced construing Latin into English instead of into French into the English grammar schools, regularly called "his Hostiarius" and paid two and one half a term when the master received 10*s.* for five boys and the term vice-monitor disappears.

It is somewhere about the fifteenth century that the word usher is first found in English. In a *Nominale* or Word Book (Wright's *Vocabularies*) we find among the names of dignitaries (*i.e.* officers) of clerks, next to master and pedagogue which are treated as synonyms, "hic *ostiarius* an usscher," clearly showing that the purely ecclesiastical use of the word had given way to its purely educational use.

In the (so-called) Edward VI schools, the charters did not prescribe any salaries to the master and usher, but left this to the governors. Usually, the proportion was settled at two-thirds of the net income to the master and one third to the usher. This seems to have been regarded as a rule where no sum was stated.

Oddly enough, we find in the earliest school lists preserved at Winchester, beginning in 1653, that the title *Hostiarius* had been dropped. The master is called *Ludimagister* and the usher *Hypodidasculus* or more generally *Pedagogus*, and it was not till 1805 that the old title of *Hostiarius* was revived. Yet until that time at both Winchester and Eton, usher was the term commonly used in English. In a controversy about salaries which arose in 1732 it was expressly stated that the usher had risen considerably in rank compared with that assigned to him by the statutes. Perhaps however the usher of Winchester or of " Eaton Schoole " was a title which, used technically, still commanded respect. The title generally had fallen into disrepute, owing no doubt to the multiplication of private schools, in which the assistant masters were nobodies hired on any terms to do the drudgery of the school and especially to look after the boys in playtime, a duty which at public schools was left to the boys themselves. (See Oliver Goldsmith, *The Bee.*) From 1805 onward, the term second master began to be used instead of usher at Winchester. Thence it has spread to all the grammar schools, till now usher is an obsolete term. It is still kept up in the title of a club of assistant masters called " the U. U." or United Ushers. But its members, though they may apply the title to themselves in jest, would not thank anybody who called them ushers in sober earnest. A. F. L.

UTAH, THE AGRICULTURAL COLLEGE OF, LOGAN, UTAH. — Founded in 1888 through the acceptance by the Legislative Assembly of the Morrill law passed by Congress in 1862. As now organized there are maintained six " Schools," — agriculture, agricultural engineering, home economics, mechanic arts, commerce, and general science. The degree of B.S. is given upon completion of any of these courses, excepting Mechanic Arts, where the work is of high school grade. A preparatory department is maintained. The Agricultural Experiment Station is coordinate with the various schools. The government of the college is vested in a board of trustees of thirteen members appointed by the governor, for a term of four years, with the approval of the state senate.

Four years of high school work are now required for admission to college courses. The faculty numbers seventy-three members of all ranks. The total attendance, including registrations in the shorter courses was 1396 in 1911–1912. Excluding the shorter course registrations the enrollment was 976.

L. E. Y.

UTAH, STATE OF. — Organized as a territory by Congress, in 1850, and admitted as the forty-fifth state, in 1896. It is located in the Western division, and has a land area of 82,184 square miles. In size it is one third larger than the six New England states combined. For administrative purposes the state is divided into twenty-seven counties and five cities, and the counties are in turn divided into one or more school districts. In 1910 Utah had a total population of 373,351, and an average density of population of 4.5 per square mile.

Educational History. — Salt Lake Valley was settled by Brigham Young, with his first band of pioneers, in July, 1847. A provisional government was soon organized, and a territorial government was created by Congress in 1850. The assembly of the provisional government, early in 1850, passed an act to incorporate the University of Deseret, and this act was approved by the territorial legislature the following year. An annual appropriation of $5000 was granted the new university, born " of great hopes and small resources." In November, 1850, the preparatory department of the university was opened. In October, 1851, the territorial legislature authorized the Chancellor and the Regents of the university to appoint a superintendent of primary schools, to be under their supervision and control, and to report to them. In December, 1854, Governor Brigham Young called the attention of the legislature to the need of more schools and longer terms, as well as schools of higher grade in the principal towns, and this same month the territorial legislature enacted the first general school law. The Chancellor and Regents were directed to appoint a Territorial Superintendent of Common Schools; county courts were directed to subdivide their counties into school districts; to appoint county boards of examiners, to examine teachers, and to make an annual report to the territorial superintendent; and the voters of each district were permitted to vote any district tax they might agree upon, in district meeting. The Territorial Superintendent was in turn to report to the Regents, and they to the legislature. This act gave shape and legal form to the school system of the territory, and continued in force for many years. By 1862 there were sixty-two schools in the territory, with forty-three male and fifty-nine female teachers employed, and 2391 pupils enrolled.

In 1865 there was an act to amend and consolidate the school law, but this was superseded in 1866 by another act which continued the old system, but which added county superintendents, to be elected by the people every two years, and made the Territorial Superintendent elective by the legislature, instead of appointive by the regents, as before. A 1 per cent district tax was now required, and districts were permitted to vote additional taxation for school buildings, up to three mills. In 1867 the university, which up to this time had had rather a nominal existence, was reorganized as a kind of a commercial college, and in 1869 the normal department was organized. In 1868 a law defined common schools as publicly organized schools, and forbade the granting of any public funds to a private school, or to any school not under the direction of the district trustees. In 1874 a territorial appropriation of $15,000 a year was made, and this appropriation marked the beginning of territorial and state aid, and had an excellent effect in stimulating both local taxation and the gradual development of free schools. The year 1875, when the first grants were made, has been designated as the date of the awakening of a new interest in education in the territory.

In 1876 another new school law was enacted. This continued most of the features of the earlier legislation, but made the Territorial Superintendent of Schools elective by the people, instead of by the legislature, and changed the title to that of Territorial Superintendent of District Schools. The proceeds of a tax on railroads was added to the funds for the benefit of common schools. In 1878 the annual appropriation was superseded by a territorial school tax of three mills, to be distributed on census. This further aided the district schools to reduce or to eliminate their tuition charges, though it was not until 1890 that the schools were finally made free. In 1884 another amended school law was enacted, and an *ex officio* textbook commission created. For some years, at about this time, Utah and the national government were in conflict, and in 1887 the so-called Edmunds-Tucker law, enacted by Congress, abolished the office of Territorial Superintendent of Schools, and instead directed the superior court of Utah to appoint a Commissioner of Schools for the territory. This office and an appointed official continued up to the beginning of statehood in 1896. In 1888 the State Agricultural College was established at Logan. In 1890 a new, revised, and much enlarged school law was enacted, which finally made provision for free common schools for all by providing for a territorial tax, county taxation, and district taxation for schools, and declared that they should be free to all children of school age.

In 1896 Utah was admitted as a state, and the new state constitution made somewhat detailed provision for a uniform and free state school system. The general control and supervision of the public school system was vested in a State Board of Education; the elective office of the State Superintendent of Public Instruction was established; institutions for the deaf, dumb, and blind were established; and both the legislature and the State Board of Education were prohibited from prescribing textbooks for use in the common schools. Only minor changes were made in the school law for some years.

Beginning about ten years ago, and continuing since, a number of important educational laws have been enacted which have materially changed and strengthened the school system of the state. In 1903 the free textbooks and supplies law was enacted. In 1905 the County boards of examiners were abolished, and uniform state questions and grading for all examinations for teachers' certificates, by a State Board of Examiners, were substituted; state aid to poor districts was begun; and a law, under which counties may abolish all districts, and create instead only one county school district, with the same powers as cities of the second class, was enacted. In 1907 a State Library-Gymnasium Commission was created; the recognition of graduates of approved normal schools elsewhere was permitted; teachers' institutes' boards of control were created; a state course-of-study commission was provided for; provision was made for instruction in sanitation in the elementary schools; a public school library fund, and a state library for the blind, were established; and the creation of a teachers' retirement fund was permitted in the cities. In 1909 the state aid to poor districts was increased to provide a total of $450; district taxation was increased from seven and one half to ten mills; all teachers, after 1911, if of less than three years' experience, were required to be graduates of a four-year high school; a schoolhouse construction supervision law was enacted; and a new state textbook commission was created. In 1911 a state high school tax was provided, a county high school law was passed, and a law was passed requiring an annual physical examination of all school children, and permitting the appointment of school physicians.

Present School System. — At the head of the present school system of Utah is a State Board of Education, and a State Superintendent of Public Instruction. This Board has general control and supervision of the schools of the state; is also charged with the duty of establishing libraries and gymnasiums; may appoint a secretary to assist in such work; and may call in additional expert help when needed, paying for such from the board's contingent fund. The State Board appoints assistant state examiners to conduct the examinations for teachers' certificates, and grants certificates to those whom the examiners approve; appoints a High School Inspector, to assist it in examining and approving schools for state-aid grants, and also prescribes the course of study for high schools; and appoints two county superintendents to assist the state superintendent and the principal of the normal school in the preparation of a course of study for the elementary schools. To avoid the constitutional prohibition as to the selection of uniform textbooks by the legislature or the State Board of Education; a State Textbook Commission has been created, which meets and selects textbooks, for five-year periods.

The State Superintendent is elected by the people for four-year terms. He is charged with the administration of the state school system, and is given general business supervision. He may investigate any matter relating to schools; decides controverted questions in school law, and makes rulings, his decisions and rulings having the force of law, until set aside by the courts; prints a summary of his rulings and decisions, and the compiled school laws; holds an annual convention of city and county superintendents; and makes a biennial report to the governor. With the secretary of the State Board of Health and an architect appointed by the governor, the State Superintendent must pass upon and approve all schoolhouse plans for new construction or for alterations costing over $1000.

For each county there is a county superintendent, appointed or elected, for a two-year term. In counties organized under the old, or district system, the county superintendent is elected by the people; but in counties organized as a single school district, under a county board of education, the county superintendent is appointed by the county board. Any county having 2500 school census children, outside of first and second class cities, may be erected into a county school district of the first class, with a county board of education of five, elected by the people, one from each election precinct in the county. In such the elected county superintendency ceases to exist, and the county board appoints a superintendent and a clerk, and has the same general powers in the county as a city school board in a city of the second class. A number of counties have voted to adopt this plan. One county is organized into two school districts, with two county boards of education, and hence has two appointed county superintendents. Cities of the first and second class, of which there are five, are under city boards of education and city superintendents, and are independent of the county organization. The county superintendent, whether appointed or elected, has general supervision of schools outside of the cities; must visit each school twice each year; makes a detailed report to the State Superintendent on each teacher visited; meets the district school officers, inspects their records, and advises with them; decides controverted questions; sees that the instruction required by law is given in the schools; holds, with the concurrence of the State Superintendent and the Principal of the Normal School, a county teachers' institute, of from two to ten days; acts as an agent for the State Board of Education in giving examinations for teachers' certificates; acts as a member of each high school board in the county; and makes an annual report to the State Superintendent.

Each county forms a single common school or a single high school district, unless subdivided by the Board of County Commissioners. This board may also consolidate school districts. For each common school district three trustees are elected, one each year for a three-year term. This board has general charge, direction, and management of the schools of the district; is charged with the care of school property; may levy an annual tax of 1 per cent for textbooks and current expenses; and must make an annual report to the County Superintendent, and to the people in annual district meeting. Cities are governed by boards of education, and each city elects its city superintendent, and manages its schools independently. Each city also adopts its own textbooks, outlines its own course of study, examines its own teachers, and levies its own taxes.

School Support. — On its admission, the state received not only the sixteenth and thirty-sixth sections, reserved in 1850, but the second and thirty-second also, in each congressional township, for common schools, — a total of 6,007,226 acres. Much of this land is as yet of but little value, though a permanent fund of over one and a half million dollars has so far been built up. A number of specific grants for educational institutions were also made to the state at the time of its admission. (See NATIONAL GOVERNMENT AND EDUCATION.) Taxation, however, is the chief support of the schools. A general state tax of three mills is levied for common schools; a county tax up to four mills, as estimated to be needed by the County Superintendent, may be levied by the County Commissioners; and district trustees may levy an additional district tax, up to ten mills, with the possibility of the taxpayers voting an additional two mills of special tax. In order to secure a general seven months' school in the state, the legislature has recently made a special appropriation to be granted to those districts which have levied at least seven mills of district tax, and in counties which have levied the full four mills, and in such amounts to each district as will bring the district's total funds up to $450 for the year.

Teachers and Training. — The state employed, at last report, 2448 teachers. Of these, 1066 were normal school graduates, 1311 had had some professional training, and 71 had had no professional training of any kind.

Beginning in 1911, all persons, except those having had at least three years of successful experience in teaching, must file evidence of having had a four years' high school course, or its equivalent, before being admitted to the county teachers' examinations, and an examination in psychology and the history of education is then required of such. The answers given in the written test, together with the county superintendent's visitation report, determine the result. All teachers must also be certified to as being of good moral character, and free from infectious and hereditary disease. For the training of future teachers, a state normal school is maintained in connection with the State University, and a branch state normal school is also maintained in the southern part of the state. A teachers' institute of ten days each year must be maintained for each county, either singly or jointly, but any county may hold ten one-day institutes instead of a continuous session. Male and female teachers must be paid the same salary for the same service. Any city may establish a teachers' retirement law, though on a contributory basis.

Educational Conditions. — The educational conditions in Utah are good. The population is sparse, but half of it is collected in the five cities and in a number of little towns. The illiteracy in the state is very low. The people are a thrifty and a provident class, who believe in education and good schools. One fifth of the total population is foreign born, but this element consists largely of English, Scotch, Norwegians, Swedes, and Danes. There are almost no negroes in the state. The schools follow a uniform course of study, based on uniform textbooks, which are provided free to all elementary school pupils. All children must be examined as to their physical condition each year by the teachers, but any board may employ a school physician to do this, instead. Instruction in morals, sanitation, and the cause of disease must be given in all schools, and all schools must be taught in the English language. Kindergartens may be established by any city, or any first-class county district. The library and gymnasium board is doing good work in establishing public libraries and town gymnasiums, and the school library is also being developed rapidly.

Secondary Education. — In 1900 there were only five high schools in the state, but by 1910 there were thirty-three. In 1911 a number of high school laws were passed, which will further stimulate the development of these schools. Under these laws, each county is made a high school district, subject to division into two or more high school districts; a state high school tax of one half a mill is added, to be distributed on attendance to the high schools approved by the state high school inspector, and local taxation, up to five mills, is also permitted. The Church of Latter-day Saints also maintains a number of secondary schools at different points in Utah.

Higher and Special Education. — The University of Utah (*q.v.*), at Salt Lake City, and the Agricultural College of Utah (*q.v.*), at Logan, stand at the head of the public school system of the state. The university includes the State Normal School and the State School of Mines, and also offers special courses in law and medicine. To finance these institutions properly, the legislature of 1911 provided that 28 per cent of all the state's revenues, not including the common school and high school taxes, should be set aside for their support, to be divided in the following proportions: to the state University and the State Normal School, 64.43 per cent; to the Agricultural College, 28.34 per cent; and to the branch state normal school, 7.23 per cent. The Brigham Young University (*q.v.*), at Provo, an institution maintained by the Latter-day Saints, offers collegiate instruction, and also maintains a Teachers College for the training of teachers for the thirty church high schools, maintained in Utah, Idaho, and Arizona.

The state also maintains the Utah School for the Blind, and the Utah School for the Deaf, both located at Ogden. The national land-grant endowments also provide for a state school for the feeble-minded, but such has not yet been established. E. P. C.

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UTAH, UNIVERSITY OF, SALT LAKE CITY, UTAH. — Organized in 1850 by the first legislative assembly as the University of the State of Deseret. During the first fifteen years, the university had a chequered career, owing to the long distance from the railroad and telegraph, and the lack of means; but in 1867 it was reopened as a business college, and two years later, a regular college course was offered, together with a normal course for the preparation of teachers. In 1884 the legislature gave the institution power to confer degrees. In 1892 the name "University of Deseret" was changed to "University of Utah." In April, 1894, the Salt Lake Literary and Scientific Association, an educational organization of Utah, which has been maintained for over fifty years by the Mormon Church, endowed a chair of geology to the amount of sixty thousand dollars. In 1894 the University received a grant from Congress of sixty acres of land on the Fort Douglas Military Reservation, immediately east of Salt Lake City, on condition that the institution should occupy the new site. In 1904 the general government added to this gift an adjoining thirty-two acres. In 1899 the state legislature appropriated $200,000 for the erection of buildings, and since that time they have added over $400,000. By a law of 1911, the University receives 64.43 per cent of 28 per cent of the state levy of four mills.

The University is constituted by law the head of the public school system of Utah. At present it comprises five schools; those of Arts and Sciences, of Education, of Mines, of Medicine and of Law. Applicants for admission must have completed the equivalent of a full high school course of four years. The University is now offering graduate courses, leading to the degrees of M.A., M.S., and M.S. in Engineering. The faculty consists of forty professors, associate professors, and assistant professors, besides lecturers, instructors, and assistants. A thousand students are registered annually, and in the summer school 1100 are in attendance, most of whom are teachers from western cities. Dr. Joseph T. Kingsbury is president.

UTENSILS, SCHOOL. — See Apparatus.

UTILITARIANISM. — The doctrine that the standard of judging the rightness of an act lies in the consequences of that act with respect to its effect upon the pleasure and pain of those affected by it. As a moral theory it is opposed to theories which, like the Kantian, hold that morality is a matter of motive not of results, and to intuitionalism which holds that rightness is directly perceived by a moral faculty, not reflectively calculated. Historically, utilitarianism is a development from hedonism, which holds that the end of desire and the highest good of man is pleasure. In fact, utilitarianism has allied itself, till recently, with the hedonistic psychology of desire and pleasure. It differed from hedonism in the fact that its primary concern was with the standard of estimating rightness and wrongness rather than with the end of action, and especially in its insistence that the pleasure and pain of all affected by an act, not simply the personal well-being of its doer are to be taken into account. John Locke is commonly regarded as the founder of utilitarianism, though the word was not used till the latter part of the eighteenth century, nor was the theory consistently worked out by him. Through emphasis upon future rewards and punishments, a kind of theological utilitarianism was developed and widely accepted among the English divines of the eighteenth century. David Hume put the emphasis squarely upon social well-being. Jeremy Bentham was the first to work out the theory in a comprehensive form. He was essentially a reformer of legislation, administration, and penal methods. His interest was not so much in the standard of private morality as in discovering and elaborating a principle that might be employed to judge the rightness or wrongness of public acts. The formulæ of the greatest good of the greatest number, and every one to count, in its calculation, for one and only one, are attributed to him. Through the influence of Bentham utilitarianism became the philosophical creed of democratic radicals. It was a register in the sphere of ethical theory of the growth of democratic aspirations. James Mill had a psychological interest which Bentham lacked and effected an alliance of the new ethical theory with sensationalistic and analytic psychology. The English economists following in the school of Adam Smith took an active part in the spread of the new doctrine, while the ethical writers generally pointed to the free play of economic forces as one of the chief agencies in uniting personal interest and general happiness. During the nineteenth century the reaction against individualism clearly showed that the weak point of utilitarianism was its association with hedonistic and sensationalistic psychology. John Stuart Mill modified the doctrine by introducing the idea of differences in the quality of pleasures which were more important than considerations of their quantity. Herbert Spencer made a further modification by linking it with the theory of evolution. According to him, rightness should be deductively arrived at by a consideration of the tendency of the consequences of an act upon the furthering of the life process of evolution. We cannot say at present that the rightness or wrongness of an act is equivalent to its pleasure or pain giving quality. At the end of the evolutionary process the individual will be completely adjusted to his environment, natural and social, and then the utilitarian ethics will be absolute in their validity, not relative as at present. Looking over the history of utilitarianism, it is evident that it has met the social and political needs of the times more adequately than any of its rivals, but that it has been badly handicapped by its adoption of a false psychology of motive, desire, pleasure, and pain. When the hedonistic factor, which came in by an historic accident rather than by intrinsic necessity, is dropped out, utilitarianism tends to merge in a broader doctrine of morals, according to which social well-being, taking into account all of its complexity, is the objective standard of morality. J. D.

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UTOPIAS AND EDUCATION. — The theories of education that are set forth in imaginary commonwealths have this value: that they present the ideas that great thinkers have desired to contribute to this particular phase of human progress. That these theories have influenced, and to-day are more likely than ever to influence, actual education is plain enough, though no utopian scheme of education has ever been put into practice as a whole, if we except the Spartan commonwealth that seems to lie behind all the utopias of Greek and medieval and modern thinkers. (See GREECE, EDUCATION IN.)

These utopian schemes are outlined in various articles, chiefly biographical, as in ANDREAE; BACON, FRANCIS; BURTON, ROBERT; CAMPANELLA; MORE, SIR THOMAS. See also the article on GREECE, EDUCATION IN ANCIENT, for the Spartan utopian scheme, and the article on PLATO, for the most famous utopia of all, namely Plato's *Republic*.

VACATION COLONIES. — See VACATIONS.

VACATION PLAYGROUNDS. — See PLAYGROUNDS.

VACATION SCHOOLS AND CONTINUOUS SESSIONS OF PUBLIC SCHOOLS. — The vacation school, like the vacation playground (*q.v.*), has arisen from the peculiar needs of city life and the long summer vacation of American schools. Both were developed largely as constructive educational undertakings, to combat the evils of the gang, the poor home, and the street. In most cases both have been begun by philanthropic societies, established as permanent institutions, and only gradually adopted by the public educational authorities.

The first vacation school of which there is any record was held in the old First Church of Boston, in the summer of 1866. This was a private undertaking, and in no way connected with the public schools of the city. A volunteer committee opened vacation schools in Providence, R.I., in 1868, and continued them until 1876, when they were discontinued. These were held in the city school buildings, and were much like the regular schools, but with sewing, drawing, and object lessons occupying a prominent place. In 1894 they were again revived and carried on until 1900, when they were finally adopted by the school committee. The first city to establish vacation schools as a part of the city school system was Newark, N.J., which began them in 1885. In 1894 the Society for Improving the Condition of the Poor obtained permission to open summer classes for instruction in manual training and a few allied subjects in four New York City school buildings, and in 1897 the vacation school idea was adopted by the New York City Board of Education, and made a regular part of the city's school system. Cleveland's beginnings date from 1895, when the Ladies' Aid Society of the Old Stone Church established the first school, the system being assumed by the Board of Education in 1903. At a conference of the Associated Charities in Chicago, in 1896, a committee was appointed to plan for the establishment of vacation schools in Chicago, and through the efforts of this committee the Civic Federation opened one vacation school in the city. In 1897 the University Settlement opened another, and in 1898 the Chicago Women's Clubs formed an organization which for years conducted a system of vacation schools in some of the more congested parts of the city. These attracted much attention throughout the United States. The Board of Education, from the first, permitted the use of public school buildings, and after a time began to assist with substantial grants of money for current expenses.

Almost everywhere, before 1900, these schools had their beginnings in private effort, gradually established themselves as a valuable adjunct to the regular school instruction, and then were adopted later by the city and the Board of Education. Only recently have cities begun their establishment without previous voluntary effort. The vacation school idea may be said to be by now firmly established, and a number of states have passed laws permitting any city to establish such schools as a part of the public school system of the city. The large cities are organizing their vacation school and playground work on a substantial basis, and the movement promises to extend so that ultimately every city of 20,000 to 25,000 inhabitants will have incorporated the vacation school into the public school system. The usual summer vacation school is six weeks in length, but recently the idea of having schools open the year round has met with some favor. Of the larger cities of the country, the organization perfected by New York is most conspicuous for its extent and thoroughness. The movement also promises to make much greater headway in the United States than in Europe, where relatively few such schools have as yet been established. The results obtained from these schools have been important. They have proved very valuable from an informational point of view, but particularly useful as a means of guiding and dealing with children of wayward and rough tendencies. The marked success of the vacation school has also called attention anew to the desirability of a further extension of public education, in the line of evening schools, vacation playgrounds, continuous sessions, public lectures, etc.

When one examines the courses of study which have been followed in different cities one sees to what an extent the vacation schools have been educational experimental stations. Different cities have followed different plans, and many cities have conducted a number of types of vacation schools. Starting with the idea of merely getting the children off the streets and into the schools for a certain number of hours and weeks during the summer vacation, and providing some form of attractive work, the schools have gradually evolved the idea not only of providing positive constructive work for all children attending, but of trying to lengthen the term, to adapt the work to needs, and to secure the attendance of as many children as possible. The lack of adequate financial support is at present the chief obstacle to a very rapid development of these schools.

As the result of many experiments, certain lines of work are coming to be accepted generally as desirable parts of a vacation school curriculum, and two distinct types of vacation schools also have been evolved. Manual training, nature study, gardening and agriculture, story-telling, music, local history and geography, sewing, cooking, play, and excursions outside the city, are coming to be generally regarded as the desirable features of a vacation school program for the first, or common, type of school. A number of cities are now using the vacation school also as an opportunity to give talks and demonstrations on the care of the sick and injured, the care and feeding of infants, and the necessity for suitable food, clothing, drinks, and for cleanliness during hot weather. In a few cities, notably Cleveland, Cincinnati, Denver, and St. Louis, a different type of vacation school has been evolved, and schools offering regular class work for backward and deficient children, and especially for those failing of promotion, have been provided. Despite the apparent disadvantages of such an undertaking, the reports from these cities indicate that excellent results have been obtained. In Cleveland, the course of instruction in the new technical high school was organized from the first on a four-term basis, each term of twelve weeks, with one week of vacation between, so that one term is always held during what otherwise is the summer vacation; and in 1911 the Board of Education adopted a plan for a twelve-weeks optional summer session in the central high school and in all elementary schools, except where the making of necessary repairs would not admit of such a plan. The St. Louis school board also adopted a plan in 1911 for seven-weeks summer Vacation Review Schools, to be conducted six days per week, and open optionally to all pupils from the fifth to the twelfth grades, inclusive. (See *Rept. U. S. Comr. Educ.*, 1911, I, pp. 151–154, for resolutions adopted.) E. P. C.

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The Annual Reports of the City Superintendents of Schools in the different larger cities having Vacation Schools usually contain detailed information.

VACATIONS. — School vacations have usually been determined chiefly by three factors, — (1) the church and other festivals; (2) climatic conditions; (3) the needs of agricultural and industrial occupations. The unsolved problem in this country concerns the long vacation. From an economic point of view it is argued that the school should be kept open in the summer as well as in the winter, for it is maintained that there is great pedagogical loss when the children give up their school work for such a long interval, and finally that in cities the children from poor homes are better off hygienically and morally in the school than at home during the summer months. On the other hand there are many hygienic advantages in the long summer vacation. It gives opportunity for the children of the well-to-do to make visits to the country, and for the children of the poorer classes to join vacation colonies, excursions, and the like.

The work of the vacation colonies has been very interesting and very successful. The first vacation colony was established in Denmark in the year 1853; in 1876 Pastor Bion established the first vacation colony in Switzerland, and as the result of his influence such colonies were established in Germany. Since that time the movement has grown, and now each year in Europe many children are taken into the country by the different societies for the promotion of vacation colonies. Many studies of the physical condition of the children sent out to such colonies have illustrated the hygienic advantages of them. An increase in height and weight and better physical condition generally have been shown by observation and anthropometric tests. Investigations by Borchmann and Leuch of children sent out in these colonies have shown a large increase both in the number of red corpuscles and the amount of hæmoglobin in the blood that remained as a permanent improvement after the children returned to their usual work.

In New York and other large cities the vacation work for children has grown to large proportions, and much can be said on general pedagogical as well as hygienic grounds for the long vacation. A long period of rest seems to be necessary for the best development. (See Playgrounds.)

While the shorter vacations may well be determined as they are usually by the church holidays and the like, this long vacation should naturally come in the period of greatest heat, and this is the general practice in most countries. A number of anthropometric investigations have indicated that summer is the time of increased rate of growth. Since the child's business is primarily growth and development, this suggests another reason for placing the long vacation in the summer; and investigations of the curve of muscular and psychic energy for the year made by Schuyten and Lobsien suggests the advantage of the usual practice of having a vacation in the spring.

Thus hygiene justifies the long vacation in the summer and the short vacation in the spring, and regard should be had for seasonal variations of energy in determining the period of study, recesses, and the like. W. H. B.

See Sessions, Length of; also Holidays.

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VACCINATION. — See Contagious Diseases.

VALENTIA, UNIVERSITY OF. — See Spain, Education in.

VALIDITY. — The soundness or strength of a principle or truth (*q.v.*). It applies alike to moral and to logical conceptions. It is closely associated with the processes of demonstration and proof (*q.v.*), but approaches more nearly the notion of value (*q.v.*). Æsthetic ideas would be spoken of, for example, as valid or invalid, although not, strictly speaking, subject to demonstration, while moral principles are demonstrated in other than logical ways. J. D.

VALLA, LAURENTIUS (1407–1457). — Humanist scholar and critic, born at Rome. After studying Greek under Aurispa and Latin under Bruni, he entered the priesthood in 1431. In 1435 he entered the service of Alfonso of Naples as private secretary and here published his famous denunciation of the Donation of Constantine (1440), attacking the papal claim to temporal power. Constantly at war with the ecclesiastical authorities, against whose traditions and morals he declaimed, he exposed himself to constant attack and was saved only by his patron from an Inquisition. Valla may be regarded as the founder of critical scholarship. His ability in this field he displayed in the *De falso credita et ementita Constantini donatione declamatio*, already referred to and his criticisms of the Latinity of the Vulgate which he compared with the Greek text, and of the extant grammars. In philosophy he was an adherent of the Epicurean views, which he compares with the Stoic in his earliest extant work, *De voluptate* (1431). His reputation as an authority on style was established not only by his own command of Latin but also by his treatise *De elegantiis linguæ Latinæ* or *Elegantiæ*, which deals with grammar style. Valla was a student of Cicero and of Quintilian and wrote notes on the first two books of the *Institutio Oratoria*. While in the service of Pope Nicholas V, which he entered after leaving Naples, he added to the translations of Æsop and sixteen books of the *Iliad*, already completed, translations of Thucydides, Herodotus (uncompleted), and Demosthenes' *De Corona*. In spite of the bitterness of his attacks and the persecutions to which they exposed him, Valla made his peace with the Church and died as Canon of the Lateran Church, where he was buried.

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VALLADOLID, UNIVERSITY OF, SPAIN — See Spain, Education in.

VALPARAISO UNIVERSITY, VALPARAISO, IND. — Established by private undertaking in 1873. Two main features characterize the institution: (1) the absence of entrance requirements, (2) the low cost of living. The University is in session throughout the year, and students may enter at any time. The duration of a course leading to a degree depends on the previous preparation of the student, but at least one year of residence is required. The University has performed a great service to those who through various causes have been unable to obtain the necessary high school preparation or whose educational career has been interrupted. The cost of living has been reduced by the elimination of the middleman and purchasing in large quantities. The University also owns several acres of land from which supplies are obtained. Board, tuition, and furnished rooms may be obtained at $141.60 for a year of forty-eight weeks. The University was opened with three departments, four instructors, and thirty-five students in attendance. The purpose of the school was to prepare teachers for their work, but since the organization of the school other departments have been added so that now the institution has twenty-six departments including general and professional (teaching, medicine, and law), 195 instructors, and an enrollment last year of 5625 different students. The usual undergraduate university degrees are conferred.

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VALUES, EDUCATIONAL. — The notion of educational values was introduced in connection with consideration of the end or aim of education. The values most commonly enumerated are culture, discipline, information (or knowledge), and utility (*qq.v.*). It is a fact worth noting that even those writers who proclaim that character is the ultimate end of education have not provided a place for character as a distinct educational value. While various theorists proclaimed that one value or an other was *the* end of education, it could not be denied that each of the terms represented an indispensable value. Attempts were made to distribute and systematize the studies of the curriculum by showing that each represents predominantly a certain value — *e.g.* arithmetic, in some of its phases utility, in others discipline; geography, information; literature, culture; etc. Such a procedure obviously ignores, and implicitly denies, the unity of the educative process, making of education a mechanical patchwork of isolated elements.

It is necessary to make at least a preliminary distinction between values which are such in themselves and values which are instrumental. The first includes those goods which are, in the pregnant idiom of common speech, invaluable. We here confront the seeming paradox that on the one hand there is no value save that of being good for something, of being of force, strength, validity, in the achievement of something. But on the other hand, unless we are to be lost in an endless circle, this "something" which confers value on its means must be valuable on its own account, not as an instrument of attaining something beyond itself. Attempts to state this ultimate "value" almost always run over into ethical discussions, especially into the controversy between the perfectionists and the hedonists. The former, influenced by Kant, draw a line between worth, which is ultimate and self-inclosed, and values, which are relative and secondary. Character, according to the Kantians, alone possesses worth. According to the hedonists, pleasures are the ultimate values which constitute and measure the value of all else. The root of the difficulty appears to lie in the attempt to set up an abstraction. Value is in reality an abstract noun denoting not just one undefinable thing but the entire complex of valuable things. The conception of valuable things throws us back upon the attitude of individuals in choosing and pursuing. Things are valuable when they are valued; that is, when they are esteemed and chosen; they are not chosen because of some external trait of value contained in them. Want, effort, and choice are more fundamental concepts than value. Hence the significance of the term "invaluable." Strictly speaking, it denotes the negation of value, not in the sense of lacking value but in the sense of representing that, which in the given situation, is outside the sphere of valuation. It is not compared at all with other ends, but is that which effectively controls the comparing and weighing of consciously considered ends. In other words, we value, or evaluate, objects only when in doubt and in the process of choosing. Value is a category of reflective comparison, or choice, not one of things in themselves. All values are instrumental, for the ultimate of any situation is invaluable.

Applying this to the matter of educational values, it appears that discipline, knowledge, character, and so forth, are phases of the educational process which the specific needs of various situations bring to consciousness from time to time. The ultimate end is simply life itself, an increase of its own vitality, and an enriching of its meaning. This is invaluable, and so undefined except with respect to the need which shows itself in life at a given time. Discipline becomes a value from the need of methodic power in the guidance of life; knowledge because of the need of insight and judgment; utility, because of the need of control of the conditions of the environment, and so on. When separated from the needs specifically indicated by situations, these "values" all have an exasperating way of slipping into one another. Knowledge for example is made an end, or "value," in itself, only when taken to signify not just objective information but also the attitude of good judgment in its use, and the refining and broadening of outlook that this information, when assimilated into personal habits, brings with it. So taken, it includes both discipline and culture. Similarly discipline means a sort of formal gymnastics unless we consider the ends for which the power gained is employed. If any one of these values has the superiority over the others, it is undoubtedly culture, for the simple reason that the term culture most readily suggests the entire process of the effective growth of life itself, not some one specific and isolated thing. But culture in this full sense is not what has conventionally figured as culture in discussions of educational values, for that has usually meant something which is specifiable in opposition to other specific ends. In brief, the whole question of values in education depends upon the nature of education (*q.v.*) itself. The attempt to settle, once for all, apart from specific situations and the differing needs of individuals, the question of values and to lay down their order of precedence, goes with the notion that there is some external or objective end beyond itself to which the educative process is a mere means.

Recognize that the educative process is in the last analysis identical with the process of life, and that life is not life save in growth, and education itself becomes an invaluable or ultimate. As life in its specific manifestation exhibits now this, now that, need, a special aim is required to meet this need, and this or that special means becomes a value. But it is as hopeless to consider educational values by themselves in the abstract, as it would be to determine the inherent value of beefsteaks, diamonds, books, or statuary apart from the specific situations in which they are to function in the lives of specific individuals. J. D.

VAN BOKKELEN, LIBERTUS (1815-1889). — First state superintendent of schools of Maryland; was educated in private schools. He founded the St. Paul's School, Long Island, and was its first principal; was principal of St. Timothy Hall, Catonsville, Md.; school commissioner of Baltimore county, and the first state superintendent of public instruction of Maryland. W. S. M.

VAN RENSSELAER, STEPHEN (1764-1839). — Politician and philanthropist, born in New York. He was educated privately and at schools in Elizabethtown, N.J., and Kingston, N.Y. After a year at the College of New Jersey (now Princeton) he entered Harvard and graduated there in 1782. Four years later he entered the army. In 1789 he began his public career, during which he was assemblyman, state senator, congressional representative, and lieutenant-governor. In 1810 he was member of the Erie Canal Commission; in 1819 he was appointed Regent of the State University; in 1820 he presided over a newly created board of agriculture which published two valuable reports, including a geological survey of Albany and Rensselaer counties. In 1823-1824 Van Rensselaer organized a series of lectures delivered by Professor Amos Eaton in the villages and towns along the canal route on chemistry, natural philosophy, and natural history. Soon after he planned an institution where the students would both learn and teach. Such a school was to give instruction " in the application of science to the common purposes of life." The school was opened at Troy in 1824 and incorporated in 1826 as the Rensselaer Institute, with Professor Amos Eaton as the senior professor. The Institute was maintained by Van Rensselaer out of his own resources for fourteen years. In 1828 he invited each county of the state to send a student to the Institute, where free tuition was given to him. Van Rensselaer was an ardent supporter of any plan for the advancement of education and of scientific research, and was probably the largest individual contributor to public and private charities in his day.

See Rensselaer Polytechnic Institute.

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VANDERBILT UNIVERSITY, NASHVILLE, TENN. — A coeducational institution founded by Cornelius Vanderbilt, who. in March, 1873, made a donation of $500,000 for that purpose. This donation was made to a corporation already organized under the name of The Central University of the M.E. Church, South, for which a charter had been issued in the previous year. Commodore Vanderbilt's donation, subsequently increased to $1,000,000, was committed to the special care of Bishop Holland N. McTyeire, who by its terms was made president of the board of trustees, with large personal powers in the direction of the University's affairs. The name of the institution was changed to Vanderbilt University. The Vanderbilt donation, which was considered a large one at that time, was in the nature of a peace-offering to the South. The new institution opened its doors in 1875, with four departments, literary, theological, medical, and law. The first chancellor was Landon C. Garland. New departments were added as follows; pharmacy and dentistry in 1879, engineering in 1886. Other gifts have been made by members of the Vanderbilt family, particularly by William H. Vanderbilt, Cornelius Vanderbilt, and William K. Vanderbilt. The citizens of Nashville contributed to the purchase of the original campus and have added to the university's funds on several critical occasions.

The University now has a productive endowment of $1,800,000 and total property of $3,000,000. Its annual income is $180,000. In 1912 it had a teaching staff of 130, and an enrollment of 1122 students, less than half of whom were from Tennessee. In the literary department Greek is required for the B.A. degree. For courses without Greek, B.S. is given. M.A. and M.S. are given after one year of graduate work. The engineering department furnishes full courses in civil and mechanical engineering. The main campus of the university comprises about sixty-four acres, covered with forest trees and blue grass, and is justly celebrated for its beauty. The law department has a three-year course and is a member of the American Association of Law Schools. The departments of medicine and dentistry hold membership in similar national organizations. The medical department is especially strong, having 396 students in 1912. A new hospital is soon to be erected on the south campus which will provide extensive clinical facilities.

Women are admitted to the department of arts and sciences on the same terms as men, but as the university has no dormitory for women, the attendance has been small. The university is governed by a board of thirty-three trustees. Its second chancellor, J. H. Kirkland, was elected in 1893 and has held office since that time. J. H. K.

VARIATIONS. — See Individual Differences; Probability, Theory of; also Ability, General and Special; Acquired Characteristics; Evolution; Heredity.

VASOMOTOR PROCESSES. — These are the changes which take place in the arteries, veins, and cardiac chambers, and are of especial importance to the student of the emotions because of the intimate relation between emotional experience and the reactions in these organs. Thus, a pleasurable experience gives rise to a free distribution of the blood. This is accompanied by a relaxation of the arterial muscles and a strong vigorous contraction of the heart. A painful experience, on the other hand, is accompanied by a high tension of the arterial muscles, and a fluttering movement of the heart. Many experiments have been made in which the pressure of the blood and the rate of the heart movement have been studied as symptoms of the emotional condition of the individual. C. H. J.

VASOMOTOR SYSTEM. — See Nervous System.

VASSAR COLLEGE, POUGHKEEPSIE, N.Y. — The oldest of the well-equipped and amply endowed colleges for women in the United States. The founder, Matthew Vassar, an Englishman by birth, amassed a fortune in Poughkeepsie. The idea of an institution for the higher education of women was urged by friends, adopted by Matthew Vassar, and a charter was obtained Jan. 18, 1861, for Vassar Female College. Two hundred acres and over $400,000 constituted the original gift; the founder's gift of money was nearly doubled later by bequest. The building progressed in spite of unfavorable economic conditions caused by the Civil War and was opened to students in the fall of 1865. Milo P. Jewett was appointed president in 1861 and resigned in 1864, when he was succeeded by John H. Raymond. The first officers of government and instruction numbered thirty, the most eminent being the astronomer, Maria Mitchell. The students numbered 353. The name of the college was changed in 1867 to Vassar College. The first class of four advanced students was graduated that year. On President Raymond's death in 1878, the Rev. Samuel L. Caldwell became president. He was succeeded in 1886, after a year's interim, by the Rev. James M. Taylor, president until 1914.

The college, according to the wish of the founder, is unsectarian. It is governed by a board of twenty-nine trustees, who are self-perpetuating and elected for life, with the exception of three members, who are chosen by the alumnæ from their own number to serve in rotation for six years. The president of the college is, *ex officio*, a member of the Board. The officers of administration and instruction number 111, of whom twenty-three are professors and eight are associate professors. The library contains (1912) 77,000 volumes. The observatory and the laboratories are thoroughly equipped. The grounds cover 700 acres and include a dairy farm and vegetable gardens for furnishing the college table. A picturesque area of ten acres is about to be converted into a natural garden. The eighteen academic and residence buildings are distributed over a lawn covering 100 acres. The chapel, given by two alumnæ in 1904, and the library, given by a trustee in 1905, are noteworthy examples of beautiful architecture.

Admission is by the examination of the College Entrance Examination Board or that of the college, or by certificate from accredited preparatory schools. The original aim — to furnish a liberal education — has been adhered to. A certain amount of Latin, mathematics, physics, or chemistry, English, history, ethics, and philosophy, as well as a reading knowledge of both French and German, is required for graduation. All other courses are elective. Nearly all of the prescribed work comes in the freshman year. All courses lead to the degree of A.B. The degree of A.M. is given after a year's graduate work in residence, or, *in absentia*, to graduates of Vassar after two years' advanced work.

Since 1905 the number of students has been limited by the trustees to 1000. Seven residence halls provide accommodations for these on the college campus. A system of self-government has been in force since 1890. No fraternities or secret societies are maintained, with the exception of Phi Beta Kappa. Flourishing organizations exist to promote debating, dramatics, and athletics, and a building devoted to the non-academic activities of the students is now in process of construction. A clubhouse for the women employees of the college has been built and endowed by undergraduates and alumnæ. The Christian Association, including in its membership nearly the whole student body, has built and maintains in Tokio a hostel for native women students. A. U.

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Vassar College.

VAUGHAN, CHARLES JOHN (1816–1897). — Headmaster of Harrow School (1844–1859) and Dean of Llandaff. Born in Leicester, he was privately educated and then entered Rugby, where he became the favorite pupil of Thomas Arnold (*q.v.*). Proceeding to Trinity College, Cambridge, he was Senior Classic and graduated B.A. in 1838, M.A. in 1841, and D.D. in 1845. In 1839 he obtained a fellowship at Trinity College. For a short time he studied law, but soon decided to take holy orders. In 1844, though only twenty-eight years of age, he was appointed head master of Harrow school, at that time fallen on very evil days. He at once set about the most important task, the moral reform of the school. His dignified and deliberate manner won over the boys, and his reliance on the monitors and senior pupils gained a strong support for him. Another important element in his success was the publication in 1844 of Stanley's *Life of Arnold*, which drew public attention and support to the new movement. Where the difficulties had caused older men to refuse the appointment, Vaughan entered in and in three years the number of the pupils had been quadrupled. He secured as associates capable teachers and earnest men. Under his administration the chapel was rebuilt, the bathing place was cleared, and small boarding houses with limited numbers were established. His religious influence was strong and his classical scholarship profound. His tactfulness and skill in diplomacy were displayed in the negotiations which led up to the establishment of the Lower School of John Lyon. In 1859 Vaughan retired, and, refusing the offer of a bishopric, became vicar at Doncaster; in 1869 he was appointed Master of the Temple, and in 1879 Dean of Llandaff, in which position he took part in the foundation of University College, Cardiff (1883). But his most notable work after leaving Harrow was the devotion with which he undertook the training of candidates for the ministry, about 450 young men enjoying the benefit of his experience and sympathy, and many attaining to positions of eminence in the church.

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VEGIO, MAFFEO (1406–1458). — Humanist scholar, born at Lodi. He became papal secretary to Nicholas V. He wrote treatises on religion and morals, and poems. He was author of *De educatione liberorum clarisque eorum moribus* (c. 1460). This is an educational treatise in six books modelled on that of Vergerius (*q.v.*). As may be gathered from the frequent exhortations to moral and religious duty, the work was written under strong religious influences. The education of girls, in which manners and character are of greater importance than letters, should be under the charge of the mother. But even here the study of Greek and Latin is more satisfactory than the practice of singing, playing, or dancing. Vegio turns more to St. Augustine and Monica than to the ancient classical writers for guidance. The work was translated into French and was the earliest educational treatise printed in that language (1513). By some error it was long attributed to Filelfo.

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VENABLE, CHARLES SCOTT (1827–1900). — College professor and textbook author; was graduated from Hampden-Sidney College in 1842 and pursued graduate courses at the University of Virginia and the Universities of Bonn and Berlin. He was instructor and professor at Hampden-Sidney College and at the universities of Georgia, South Carolina, and Virginia. His educational publications include *First Lessons in Number*, *Intermediate Arithmetic*, *Practical Arithmetic*, *Easy Algebra*, *High School Algebra*, and *Elements of Geometry*.

W. S. M.

VENEZUELA, EDUCATION IN. — The Republic of Venezuela, comprising an area of 393,967 square miles, was formerly a part of Colombia, from which it seceded in 1830. Politically the country is a federal republic comprising at present twenty states, the Federal District, and two territories, with a total population of 2,713,703. The progress of Venezuela has been hindered by internal disorders and foreign entanglements, but with the new constitution, dating from 1909, the country appears to have entered upon a period of progress. Each of the constituent states of the republic is autonomous in respect to its internal affairs, including education; the federal constitution and laws provide that primary instruction shall be free and compulsory; but the enforcement of these provisions is left to the individual states. The functions of the minister of public instruction pertain to the control of federal institutions, the disbursement of government appropriations for education, and the enforcement of regulations common to all states.

The schools for primary instruction are classified as federal, state, municipal, and private. Although all religious denominations are tolerated, the state religion is Roman Catholic, and a large proportion of the private schools are under the direction of the clergy or of the teaching orders of this church.

The state superintendents of public instruction report annually to the minister respecting the condition of the schools under their control, as do also the directors of subsidized private schools. The latest report of the minister, issued in 1912, gives the following particulars of the primary schools:—

Classification of Schools	Number of Schools	Enrollment	Average Attendance
Federal	1,077	31,506	24,966
State	253	7,711	5,801
Municipal —			
1st grade	234	8,642	6,149
2d grade	11	586	413
Private	99	3,421	2,301
Total	1,675	51,866	39,190

Of the total number of primary schools, 255 were mixed, 786 were for boys only, and 634 for girls only.

The fête of arbor day, imitated from the United States, is annually celebrated on the 5th of May by pupils and teachers throughout the country.

The federal government maintains two normal schools for the training of teachers, one at Caracas for women, which had 148 students in 1910, the other at Valencia for men, having 70 students.

All the branches taught in the elementary schools are included in the normal school course and in addition those pertaining to the theory and art of education.

Provision for secondary education is made by public and private institutions. Among the former are the national colleges, which are of two orders; one preparing for the universities, the other for commercial life. Local secondary schools are maintained by the states, municipalities, and private managers.

The report for 1910 gives the following statistics of the secondary institutions:—

Colleges	Number	Number of Students
National —		
For boys	15	508
For girls	19	925
Local —		
For boys	50	2913
For girls	22	1061
Total	106	5407

The combined enrollment in primary and secondary schools, viz., 54,125, was equivalent to 2 per cent of the population.

The institutions of higher education include the following: the Central University at Caracas, registering 100 students, and the University of the Andes at Mérida, with about 50 students; three theological seminaries, and the federal military and naval academies at Caracas. There are also at the capital a well-equipped school of arts and trades, the National Academy of Fine Arts, and a conservatory of music. The total expenditure for public instruction in 1909 amounted to 3,202,036 bolivars, equivalent to $617,993. Of this amount, 1,383,278 bs. ($266,973) was incurred for primary education.

In his report for 1910, already referred to, the minister of public instruction dwells upon the backward condition of the republic in respect to the provision of primary schools and the adaptation of both primary and secondary education to the actual conditions of modern life. The pressing need of improvement is fully recognized by the federal government, which, while it cannot control the interest throughout the states, necessarily leads in the forward movement, and may develop the federal institutions in advance of those sustained by the states and local managers. The purposes of the central government have been indicated by the appointment of commissions to investigate modern methods and standards in Europe and the United States, which action has brought about plans for a complete revision of the educational system. These plans look particularly to the improvement of the normal schools; to the increase in the number of high grade primary schools, and to the supply of needed facilities for training in the sciences and in their industrial application. Measures have already been taken to establish and equip a federal college of agriculture, with a staff of foreign professors of acknowledged competence.

A. T. S.

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VENTILATION OF SCHOOL BUILDINGS. — Window Ventilation. — There are three general methods of ventilation, or, speaking more exactly, there are three so-called methods of ventilation used in schools. The first and by far the most commonly used, outside the larger cities and towns, is that of open windows. Practically all the country schools, and most villages, rely chiefly on this method, especially in mild weather. In fairly cold weather, when the temperature outside is 30° to 40° F. below what it ought to be inside the schoolroom, an uneven sort of ventilation may be secured by properly manipulating the windows. Since so many teachers must still depend on this plan for whatever ventilation is secured, the following suggestions are offered with reference to adjustment of windows: in cold weather with the sash lowered from the top and with windows on but one side, fresh air will rush in and warm air will find its way out. It is easily possible thus to introduce abundance of fresh air. But the trouble comes in warming it before it reaches the breathing line, and in distributing it regularly throughout the room so that the teacher and pupils may have a continuous and sufficient supply. If the sashes are raised from the bottom and lowered from the top, the heavy cold air will fall quickly to the floor, and gradually spread toward the opposite walls. Such a condition may cause dangerous differences in temperature near the window side and at the floor line from those prevailing higher in the room, or even on the opposite side of the room. Window boards will remedy these difficulties to a degree and should be used in cold weather where ventilation is wholly by means of single sash windows. These window boards can be made in three general forms. A solid board six or eight inches in width can be used to close the aperture tightly when the window is raised, so that the air may pass upward through the opening thus made by the lower sash slipping past a part of the upper sash. This will give incoming air an upward movement and will permit it to take up some of the heat of the warmer air in the room before settling to the breathing line. If the windows are already high from the floor, and it seems wise to conserve all the space for light, this window board can be made in the form of a sash hinged in the middle, and glazed so that comparatively little reduction of the glass surface of the windows will result. In this case the sash board may be a foot wide to advantage, for the upper part of the lower sash will thus slip farther past the lower part of the upper sash, thus increasing the upper direction of the incoming current, as well as offering a better opportunity for warming the fresh air before it reaches the breathing line. There is still another form of window board or sash which can often be used to better advantage than those above mentioned. This consists of a sash with glass fitted in it. Instead of hinging it and using it to close the aperture made by raising the lower sash, it is fitted into grooves or fastened in the window casing two or three inches inside of the regular sash. This sash can be dropped into its grooves and the window raised without directly exposing the children opposite to a draught. For while the air will rush in, it will strike the glass in the sash board and be directed upward. This device, as will be seen, forms a sort of double sash for the lower part of the window. The air will be partially warmed as it passes between the glass, and its upward direction will help to prevent disagreeable draughts. This plan is to be recommended especially in country schools in places where cold weather prevails but where double sashes throughout seem unnecessary and undesirable. In very cold climates where winds are troublesome, double sashes in all the windows are much to be preferred. It will need no illustration or discussion for any one with a passable imagination to see that with double sashes, these can be so adjusted to each other that the space between the glass can be used to admit fresh air in the same way as that mentioned above.

Gravity System. — But taking conditions as they are usually found in schoolrooms all the year round, it is practically impossible to effect proper, constant, and regular ventilation by the use of ordinary windows, though this is a system which may be amply sufficient for dwellings. The next method for consideration is that in which advantage is taken of the fact that warm air is lighter than cold air, and that fresh air can be introduced into a schoolroom by heating it. It is evident from the outset that this method, an example of the so-called gravity system, will be practicable only in cold weather, and hence cannot be used on mild or warm days. The simplest form of this method consists in the use of the jacketed stove, and is applicable chiefly to a single room. There are various forms of the jacketed stove on the market, but the essential feature of all consists in introducing fresh air through a duct connecting the space between the jacket and the stove with the outside air. As the air encircling the stove is heated, it rises, and thus a constant flow of warm fresh air is introduced into the room. The duct communicating with the fresh air usually runs under the floor between the supporting timbers. It is best to make it of galvanized iron and sufficiently large to permit the air to pass easily. It should be so carefully fitted beneath the stove as to prevent any air being drawn in from under the house. The outer end can be fitted with a wire screen and wind shields so constructed as either to take advantage of the force of the wind or to guard against it, as conditions may warrant. It will also be observed that the draught of the stove comes from the schoolroom and that the doors are so constructed as to prevent ashes, cinders, or fuel from entering the jacket. The jacket is taller than the stove and serves to keep the entering air sufficiently near the fire box to take up the heat. The warmed air will rapidly ascend, thus creating a draught through the duct from the outer air, and will scatter more or less evenly through the room, furnishing some ventilation as well as heat.

This method cannot be relied on for satisfactory ventilation save in very cold weather; and even then its success will depend largely on the kind of building used, the size, and proportions, of the room. Some advantage has been gained by introducing the so-called foul air exhaust. But unless the air in this pipe is well heated by the smoke pipe from the stove there will be little suction, for the air near the floor line is likely to be rather cold and therefore comparatively heavy. This duct is helpful, but its value is easily overestimated. It would be better where possible to have an open fireplace or grate through which this exhaust could be made effective.

The hot air furnace works on exactly the same principles, but is designed to warm and partially ventilate the whole building. Here of course the hot air must be carried from a central source to the various rooms of the building. The amount of fresh air introduced into any room by this method will depend: (1) on the size, direction and length of the duct leading to it from the hot air chamber; (2) on the difference between the temperature in the hot air chamber and in the room; (3) on the opportunity for the air already in the room to escape; and (4) on the direction and force of the wind. If the exit ducts, which ought to be near the floor line on the same side as the entrance ducts, are large and so constructed that a gas jet can be kept burning in them, or if constructed in the form of a chimney, the heat of an open fire may be allowed to escape through them, the out-pull will be much increased and accordingly more fresh air will enter through the duct from the warming chamber. With such aids as here suggested some ventilation can be secured in mild weather. The fresh air duct should deliver the air at a height of about eight feet from the floor, and it should enter the room from an inner wall. It cannot be too often repeated, however, that it is not possible to secure good ventilation in schoolrooms by any gravity system save in very cold weather. At other times, unless aid is sought from mechanical means, recourse must be had to open windows. It is only fair to say that in mild climates no large modern school buildings, constructed under competent advice, are depending on gravity alone for successful ventilation. But great numbers of otherwise good buildings are being built without such advice and a great amount of money is accordingly being wasted. Further discussion of this method will be found under the topic on heating (*q.v.*).

Mechanical Methods. — *Vacuum System.* — The next method of ventilation of school buildings to be discussed is that in which some mechanical force is applied to bring air into the rooms. This result is accomplished by fans or blowers propelled by any form of mechanical energy most readily available, and most satisfactory for the purpose. There are many forms of fans, or blowers, on the market, and no attempt will be made here to suggest relative values. This is the work of the engineer, applied to each specific building and locality. One form of applying the fan is to set it so as to exhaust the air from the rooms, causing a partial vacuum. The fresh air will then enter through the ducts connected with the outside. When the vacuum system is used two rather serious objections arise. First, it will be almost impossible to control the source from which the entering air will come. Since the effectiveness of this system consists in creating a partial vacuum, air will rush in through every crack and crevice in the room; this will bring in foul air from halls and from inside and outside walls, as well as fresh air through the inlet ducts. In the second place, the exhaust fan must be placed either in the upper part of the building, in which case there are apt to be jarring noises and difficulties of mechanical control, or else placed in the basement, in which case the lighter air during cold weather must be pulled downward and thus more force will be required.

Plenum System. — The second method of applying a mechanical system consists in so arranging the fan as to drive the air into schoolrooms. This, obviously, will create a density slightly above that in the outer air and will thus tend to drive out the foul air as well as drive in the fresh air. This method gives entire control of the source from which the fresh air is taken, and operates so as to call for the most advantageous location of the fan. This is generally known as the plenum system. Under certain conditions the vacuum and the plenum systems may be combined; but, save in special and difficult conditions, this is inadvisable in school buildings.

It is clear that with either of these systems adequately adjusted to its task ventilation can be accomplished regardless of the outside temperature. In warm weather the air will need no heating, and in cold weather it can be heated to the temperature required, thus assuring the introduction of sufficient air at all times. Furthermore, the plenum system affords a ready opportunity to calculate the exact amount of fresh air furnished to each room or to the building as a whole, and, having determined the amount needed, to know with certainty at any time whether the rooms are receiving enough air to supply the pupils. In this connection it will be well to consider briefly the amount of fresh air needed for each pupil, in order to furnish a basis for calculating the amounts each room will need. Generally stated each child vitiates about one hundred times as much air in an hour as it will breathe. Naturally the amount breathed will depend on the age and physical condition of the child. It will be a safe estimate, though necessarily a rough one, to say that a child in the primary grades at ordinary quiet work will breathe twenty cubic feet of air each hour; one in the upper grammar grades similarly conditioned will breathe twenty-five cubic feet of air per hour; and that a high school pupil in the upper classes will breathe thirty cubic feet per hour. It is evident, then, that if two thousand cubic feet of air per hour be delivered for each primary pupil, twenty-five hundred for each pupil of the upper grades, and three thousand for each high school student, one of the chief conditions of ventilation has been met.

The estimates above recorded are in line with the latest investigations, but such amounts are rarely secured in actual practice. In order to determine at any time how much air is being driven into any given room, the anemometer is used. This is simply a small delicately adjusted windmill hitched to clockwork, so as to register the rate at which the air is moving. By placing this instrument at the inner end of the entrance duct, registering the rate of incoming air, multiplying this by the net square surface of the end of the duct, and by the time under consideration, the product will give the amount of air introduced. The experimenter should be cautioned to test the rate at various places in front of the duct, and not simply at the center. The average of these will give an approximate rate for the whole duct. The rate at the center of the duct is usually higher than at the sides. Every city school system should have an anemometer, and the principals of all buildings should be taught to use it. The amount of air furnished to the entire building can be calculated also by determining the speed and size of the fan, the pressure in the discharge outlet, and the caliber and length of the ducts leading to the rooms. Such calculations are beyond the power of an ordinary janitor or even of most teachers to perform, and, moreover, the results when obtained would be of comparatively little value to the principal. For practical purposes it is easier and better to measure the amount delivered to each room in the manner suggested, and determine specifically for that room whether the pupils are getting sufficient fresh air. By doing this for each room any error in evenness of distribution to the various rooms can be discovered. In this connection it is well to caution those who use the anemometer to take repeated readings and to handle the instrument carefully and intelligently during the experiment, for most varieties are subject to rather decided variations as the result of friction in the bearings. The instrument must be well cleaned and in perfect order to get reliable results.

Air Ducts. — The location and size of the ducts leading to and from the rooms for both gravity and plenum systems is a matter of vital importance in the success of these systems. The duct carrying fresh air to the schoolroom should open from an inner wall, preferably on the side opposite the windows, near the middle of the wall, and at least eight feet from the floor. This duct should be large so as to permit the entrance of enough air at a velocity sufficiently low to prevent troublesome draughts. The end of this duct in the schoolroom should be so shaped as to spread the incoming current of air toward the ends as well as toward the ceiling of the room. This precaution will materially aid in ventilating the corners of the room. The foul air ducts should open from the same side of the room as the fresh air ducts, but near the floor line. There should be two of these, one a little toward the rear of the room, and the other toward the front. When cloakrooms open into the schoolrooms, as they should in all buildings for the elementary grades, they should be placed at the teacher's end of the room. When so placed, instead of opening both foul air ducts from one side of the room as suggested above, it is advantageous to leave openings in the lower part of the doors to the cloakroom for the exit of warm air, in order not only to warm and ventilate the cloakroom, but to dry damp wraps during rainy inclement weather. Within the cloakroom an exit duct should open at least seven feet above the floor so that it may never be closed, or even partly obstructed, by any article of clothing. With a plenum system there would then be a constant change of air in the schoolroom and also in the cloakroom. The difficulty of securing an even distribution of fresh air has not received the consideration it deserves. When the temperature of the fresh air which is being driven into the schoolroom is higher than that of the air already in the room there is naturally a tendency for it to float on the colder air, especially if the opening of the entrance duct is seven or eight feet above the floor; hence only as the result of a decided plenum and a corresponding active suction through the exhaust ducts is it comparatively easy to distribute the air downward toward the breathing line. Of recent years this difficulty has been overcome in churches and theaters in certain cities by introducing fresh air at the proper temperature through the legs and bases of the chairs and benches. It is claimed that this method overcomes the fatal objection to bringing it through gratings in the floor, for in this way it lifts no dust because the openings through and under the seats are well above the floor and thoroughly guarded against the entrance of dirt and dust. Naturally this method, if perfected for schools, would leave little to desire, for theoretically it would insure absolutely pure air, and a thorough distribution where most needed. The problem of ventilating a theater or church consisting in the main of one large room is very much easier to solve than that of ventilating for a large part of a day many rooms at different levels and of different sizes. The experiments so far made in this direction for schools have resulted in no final word.

The influence of wind upon ventilation has recently been investigated, and the results show that striking differences result in ventilation efficiency in rooms whose outer walls are exposed to the force of the wind, and also those whose outer walls are on the leeward side. Well-built brick buildings, as well as frame buildings, admit air through walls and about windows during steady winds more than has been expected. A plenum system, that evenly distributes the air through the building in calm weather, may prove very inadequate during heavy winds. When the winds are strong the leeward side of a building, by reason of the exhaust caused by the suction of the moving air, will draw more air from the fan than the exposed side where the pressure of the wind against and through the building will create an added pressure, thus retarding the flow from the fan into the room. The knowledge of these facts should be considered both by builders and by those whose duty it is to regulate ventilation. It is essential for the success of any plenum system that the walls of schoolrooms should be as nearly air-tight as ordinary construction will make them. The windows and doors especially should be carefully cased and set, and always kept closed. This demand may seem impracticable to teachers and patrons, who do not understand that with the plenum system, when the windows in one room are open, the other rooms are being robbed of their air supply; but at the present state of the development of the plenum system the only thing for a superintendent to do is to explain and then to insist on having the windows closed during school hours.

The plenum system as well as the gravity system may be aided very much in doing its work by installing in the exhaust ducts a steam coil or gas jet as an auxiliary to cause a more rapid movement of the foul air. Were it not for the danger and work involved in keeping a slow open fire in the schoolroom, the fireplace and its chimney would form an ideal exhaust vent for the foul air. When steam is used as the heating agent it is comparatively easy and safe to inclose in the exhaust duct a coil of steam pipe to do this auxiliary work.

Circulation of the Air Needed. Recent experiments show that much of the depressing effects of poor ventilation may be due to the accumulation of heat within the body and that a vigorous circulation of the air within the schoolroom will do much to prevent these discomforts. Those, however, who maintain that these experiments have made it necessary to reconstruct all our theories of ventilation are making claims which cannot be justified. The human organism was evolved in the open air, and the physiological functions were adjusted accordingly. Hence without pure air their relations will be disturbed. There can be no doubt, however, that our schoolrooms would be far more comfortable if the air were in constant and regular circulation comparable to that out of doors; for then the excess of body heat would be drawn off, and the blanket of moisture surrounding the body would be evaporated. But no system of ventilation which does not furnish pure air to all the pupils can be satisfactory. We need first pure air, and then circulation of the air. A circulation of foul air is not ventilation.

Air Filtering. — In addition to furnishing fresh air to schoolrooms, modern cities are confronted with a problem of filtering the air of its dust, dirt, and soot, before delivering it to the children to breathe. The dust nuisance has commanded more attention, since careful experimentation has shown that it is also dangerous. Pathogenic germs cling to dust particles, and when introduced into schools may develop disease entirely avoidable with clean air. Air filtration consists in some form of air washing. By subjecting the incoming currents to impingements on wet canvas or wire screens, to sprays of water, or to all these combined, the dust is caught and washed away. A recently developed and promising form of air washer and humidifier consists in attaching to a fan a "filter ring consisting of many layers of steel or copper wire cloth spaced radially a short distance apart and arranged in narrow sections side by side." Jets of water are then thrown into the revolving fan, thus bringing the air into thorough contact with the water, thereby ridding it of dust and soot, and allowing it to take up moisture. The amount of moisture taken up will depend on the temperature of the air, its percentage of saturation, and the temperature of water brought into contact with the air. Devices for automatic regulation of these factors are also introduced. F. B. D.

See Air of Schoolroom; Heating.

For references see Architecture, School.

VERACITY. — See Probability; Proof; Truth.

VERBAL ANALYSIS. — See Word Analysis.

VERBALISM. — A term used by Quick (*Educational Reformers*) for verbal realism, which is used by Von Raumer to indicate the learning of things not directly but only by reading. Thus astronomy was studied without an observatory, the sciences without experiments or concrete materials, agriculture without a farm, and everything on the authority of the ancients, *e.g.* Aristotle, Pliny, Aratus, Galen, Columella, and others. The best example of this tendency is Rabelais (*q.v.*). It is against this verbalism or verbal realism, sometimes called humanistic realism, that Milton (*q.v.*) inveighs when in the *Tractate* he says that "language is but the instrument conveying to us things useful to be known," and advocates the "orderly conning over the visible and inferior creature," and the study of "the solid things."

When the term "realist" was introduced to denote the student who concerned himself with things alone, it was contrasted with verbalist, the student who devoted himself to elegance of style, grammar, criticism, etc.

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VERGERIUS, PIETRO PAOLO (*c.* 1370–1445). — Humanist scholar, born at Capo d'Istria. He studied at Padua and Florence, and seems to have obtained degrees in the arts and medicine. He was professor of logic at Padua. He accompanied Cardinal Zarella to Constance and later entered the service of Emperor Sigismund, for whom he translated the *Anabasis* of Arrian into Latin. At Constance he was selected to write the epitaph in memory of Chrysoloras (*q.v.*), from whom he had learned Greek. Vergerius was the author of one of the most widely read educational tracts which in many respects recalls Quintilian, to the study of whom he had already published an introduction. The *De ingenuis moribus et liberalibus studiis* (*On the manners of a gentleman and on liberal studies*), this complete title being found in some Mss., was addressed to Abertinus, the son of Francesco Carrara, lord of Padua about 1404. Here Vergerius shows considerable insight into boy nature and the methods of handling boys, and deals with the essentials of good character. Best known, perhaps, is his definition of a liberal education: "We call those studies liberal which are worthy of a free man; those studies by which we attain and practice virtue and wisdom; that education which calls forth, trains and develops those highest gifts of body and of mind which ennoble men, and which are rightly judged to rank next in dignity to virtue only. For to a vulgar temper gain and pleasure are the one aim of existence, to a lofty nature moral worth and fame," — words which breathe the very essence of the spirit of the Italian Renaissance. For a gentleman or a prince, says Vergerius, two careers — letters and arms — are open, but some acquaintance with both is essential. While dealing in the main with literary studies, Vergerius does not neglect the importance of bodily exercise, for "a true education will aim at the efficient training of both the Reason, that it may wisely control, the Body, that it may promptly obey." It remains only to give the studies recommended by Vergerius: history, moral philosophy, eloquence (including grammar, rules of composition, and disputation or logical argument), poetry and the poetic arts, arithmetic, geometry, astronomy, and nature study. But "the choice of studies will depend to some extent upon the character of individual minds." For recreation Vergerius recommends outdoor sports, music and song, and the game of "tabulæ" (probably a chess game). The treatise passed through some forty editions before 1600.

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VERGIL. — P. Vergilius Maro, Rome's greatest poet, and, next to Homer, the greatest epic poet of antiquity, first showed his genius in a series of pastorals (*Eclogues* or *Bucolics*), which he wrote when still a young man under the influence of Theocritus. He next, at the suggestion of Mæcenas, wrote the *Georgics*, a farming treatise in four books, in order to win the degenerate Romans back to the soil. In this, the most finished poem in Latin literature, he was much influenced by Hesiod. He achieved such fame at Rome when this work was published that the whole audience rose upon his entering the theater. The last years of his life he devoted, at the insistence of Augustus, to the composition of a national epic. This, the *Æneid*, in which he celebrated the founding of Rome by Iulus son of Æneas, a Trojan hero, and mythical ancestor of Cæsar, was not entirely revised when Vergil died, and was published later, but without any material modification.

The *Æneid* made a profound impression upon the whole Roman world. It was at once recognized as the highest expression of Roman genius, the embodiment of the idealized spirit of the Roman nation. Innumerable commentators found it the source of all wisdom and all morality, and even Christian writers came to regard its author as an inspired teacher, and one of the *Eclogues* as a prophecy of the coming of Christ. As time went on, legend after legend clustered about the name of Vergil, until in the Middle Ages he came to be commonly regarded as a wizard of remarkable power, sometimes baneful, but more often benevolent. The position accorded to him by Dante in the *Inferno* is well known.

Our chief source of information as to Vergil's life is a biography, probably by Suetonius, prefixed to the commentary of Ælius Donatus. This is encumbered by a mass of medieval legend, but has been critically pruned by Reifferscheid (*Suetoni Reliquiæ*, Leipzig, 1860), and made the subject of detailed investigation by Nettleship (*Ancient Lives of Vergil*, Oxford, 1879).

Vergil did not lack critics, even in antiquity, who accused him of many faults, particularly of plagiarism from Greek originals. The most extensive of these criticisms is found in the fifth book of Macrobius's *Saturnalia*. Several ancient commentaries have been preserved, the most important being that of Servius (ed. Thilo and Hagen, Leipzig, 1881–1902). For a discussion of the growth of the Vergilian legend, both literary and popular, Tunison, *Master Virgil* (Cincinnati, 1890), should be consulted, and especially Comparetti, *Vergil in the Middle Ages* (New York, 1895).

There have been numerous editions of Vergil since the *princeps* of 1469 (?). The most important modern critical text is by Ribbeck (ed. maior, Leipzig, 1859–1868; ed. minor, 1894). The new Oxford text is by Hirtzel (1900), the minor works by Ellis (1907). Of editions with commentaries may be mentioned the massive edition of Forbiger with Latin notes (4th ed., Leipzig, 1872–1875), and those of Benoist with French notes (Paris, 1869–1872), and of Conington with English notes (London, vol. 1, 5th ed., by Haverfield, 1898; vol. 2, 4th ed., by Nettleship, 1884; vol. 3, 3d ed., by Nettleship, 1883). Serviceable English editions are also those by Kennedy (last ed., London, 1895), Papillon and Haigh (London, 1892), and Sidgwick (Cambridge, 1899). Especially noteworthy is Norden's monumental edition of the sixth *Æneid* (Leipzig, 1903). There are numerous school editions in all languages.

Poets, scholars, and critics have found Vergil a fruitful and alluring field of study, and the teacher should not consider his task accomplished by the mere elucidation of the text. For further study the following selection of authorities is recommended: Sellar, *The Roman Poets of the Augustan Age; Virgil* (3d ed., Oxford, 1897); Glover, *Studies in Virgil* (London, 1904); Cartault, *Étude sur les Bucoliques de Virgile* (Paris, 1897); Heinze, *Virgils Epische Technik*, (2d ed., Leipzig, 1908). Sainte-Beuve's *Etude sur Virgile* is still illuminating. Special chapters on Vergil are found in the following: Myers, *Classical Essays* (London, 1883), Tyrrell, *Latin Poetry* (Boston, 1895), Nettleship, *Suggestions Introductory to a Study of the Æneid* in *Lectures and Essays* (Oxford, 1885), Warren, *Virgil and Tennyson* in *Essays of Poets and Poetry* (London, 1909), Mustard, *Tennyson and Virgil* in *Classical Echoes in Tennyson* (New York, 1904), Plessis, *La Poésie Latine* (Paris, 1909), Warde Fowler, *Religious Feeling in Virgil* in *The Religious Experience of the Roman People* (London, 1911). In the study of the narrative Boissier's *Country of Horace and Virgil* (New York, 1896) will also be found helpful. The significance of the fifth *Eclogue* is discussed in three studies by Mayor, Fowler, and Conway, *Virgil's Messianic Eclogue* (London, 1906).

The language and style of Vergil have been the subject of many, usually short, treatises. Noteworthy is Antoine's *De casuum syntaxi Vergiliana* (Paris, 1882). Invaluable is Wetmore's *Index Verborum Vergilianus* (New Haven, 1911). Unusual variations in meter are gathered together in Johnston, *The Metrical Licenses of Vergil* (Chicago, 1898). A stimulating recent study is Roiron, *Étude sur l'Imagination Auditive de Virgile* (Paris, 1908).

For the purposes of school illustration Miller's *Two Dramatizations from Vergil* (Chicago, 1908) may be employed, while Warren's dramatic narrative, *The Death of Virgil* (Oxford, 1907), is a delicate appreciation of Vergil's nature and temperament which may be read with profit by any student. G. L.

VERIFICATION. — See Hypothesis; Induction and Deduction; Proof; Truth.

VERIFICATION, METHOD OF. — See Rediscovery, Method of; Induction and Deduction.

VERMONT, STATE OF. — One of the New England States, with a land area of 9135 square miles. For administrative purposes the state is divided into fourteen counties and these are in turn divided into 240 organized and 4 unorganized towns, 31 independently chartered and organized school districts, 3 city school districts, 3 specially organized towns within towns, and 4 gores. In 1910 Vermont had a total population of 355,956 and a density of population of 39 persons per square mile.

Educational History. — Schools were established by voluntary action in Vermont years before there was any law on the subject. At some time before 1763 Bennington, for example, had levied a town school tax, and in 1763 it also voted money for the erection of three schoolhouses within the town. In 1777 the territory was declared an independent state and a state constitution formed, and in 1788 the state government was organized. The constitution of 1777 ordered a school or schools in each town, with such salaries to the masters as would enable them to teach at low prices; advised a grammar school in each county and a university for the state; and ordered that societies for the promotion of religion or learning should be encouraged. In 1780 the first chartered academy (Clio Hall) was established at Bennington. It was not until 1782 that the first general school law for the state was enacted. This gave legal sanction to the school system which had sprung up; authorized the towns to subdivide into school districts, and to appoint trustees for the care of the schools established; and gave the prudential committee of the towns or districts power to vote a tax for one half the cost of the schools, and the district trustees power to raise the other half, either by a general property tax or by levying it on the pupils attending. So the matter of taxation *vs.* the rate bill was left open for yearly settlement, and this condition continued in some towns for nearly three quarters of a century.

In 1786 a new state constitution was adopted. In this the educational clause was modified and made less mandatory, merely reciting the kind of schools which ought to be established, and directing the encouragement of religion and learning. In 1791 the state was admitted to the Union, under the constitution of 1786. In the revision of 1793 this provision was retained and has since remained unchanged. In 1797 the first attempt at supervision was made by a law which declared that districts not properly maintaining a school should forfeit their share of the town's school money, and which required that instruction in reading, writing, and arithmetic be provided. The districts were now given power to vote the entire school tax on either a property or a pupil basis. By 1800 many towns had established schools, supported wholly or in part by taxation. Many towns had also originally set apart town lands for the partial support of schools.

In 1810 a school tax of 1 per cent was permitted to be assessed by the towns for the purpose of providing a two-months school term; in 1821 the county grand juries were directed to inquire if the towns had raised or properly expended the tax required to be levied, and imposed fines upon towns which did not require the maintenance of schools; in 1824 the school tax was increased to 2 per cent, and in 1826 to 3 per cent; and in 1825 a state school fund was created by the legislature, to be eventually used for the partial support of the schools. In 1833, however, this fund was directed by the legislature to be held as a reserve fund for state debts, and, in 1845, when the fund had accumulated to $235,000 and the debt of the state to it to $224,000, the legislature voted to pay the debt by appropriating the fund.

Stimulated by the creation of the fund in 1825, the legislature of 1827 enacted a number of important school laws. The power of districts to raise money for erecting school buildings by a tax levied on the pupil was taken away; the beginning of a licensing system for teachers by town officers was made; orthography, grammar, geography, history, and good behavior were added to the list of statutory subjects; towns were ordered to choose a town superintending committee to have general charge of all the schools, to visit and inspect them, and to make statistical returns to the secretary of state, who was created *ex officio* a kind of rudimentary state superintendent; and the legislature was to elect a board of five commissioners for common schools, to select and advise as to textbooks, and to recommend new legislation to the legislature. In 1833 all laws relating to supervision were repealed, however, and until 1845 there were no supervisory officers for the schools.

In 1845 a new school supervision law was enacted, virtually reëstablishing the 1827 conditions. Each town was to elect a town superintendent with duties similar to those of the 1827 committees; a county superintendent was provided for, to awaken interest in the counties; to a state superintendent, to be elected by the legislature, was given the same supervisory duties as were formerly given to the state board of five school commissioners, created by the 1827 law, and to the secretary of state, except the recommendation of textbooks. This law proved to be too great a degree of centralization for the independent towns, so in 1849 the county superintendency was abolished, and in 1851 the legislature abolished the state superintendency by refusing to make an election. Only town supervision remained until 1856, when a state board of education, with a secretary, was created, after the Massachusetts plan. To the new state board of education was given practically the same powers previously intrusted to the 1827 board of commissioners, with the added one of electing its secretary.

By 1850 a law was enacted which took from the districts their power to levy money for the payment of teachers' wages by basing the rate on the pupil, and put such levy in the future wholly on the taxable property of the district, as had been done in 1827 with reference to a tax for school buildings. In 1858 a new law required the examination of teachers to be public instead of private. In 1864 the culmination of the process of making the schools free came in a law which required that the fuel tax and the cost of school supplies should likewise be assumed by the districts or the towns. In 1865 a state reform school was established, and in 1866 three state normal schools were provided for. The establishment of state normal schools came as the culmination of a series of private efforts in the training of teachers, extending backward over more than half a century. By 1878, one teacher in every eight in the state had attended one of the Vermont normal schools. In 1866 the State Agricultural College was established at Burlington, in connection with the University of Vermont. In 1870 the beginnings of the end of the district system (*q.v.*) were made in a law permitting towns to abolish it voluntarily and substitute the town system. By 1884 only nineteen of the 240 towns had done so, and that year the legislature required all district system towns to vote on the proposal. In 1892 the district system was finally abolished by law throughout the state.

In 1874 the state board of education and its secretary, created in 1856, were abolished by the legislature, and a superintendent of education, to be elected by it, and with practically the same duties as the secretary, was created instead.

A law of 1888 changed from the town to the county as the unit of supervision and provided for county boards of education and a county superintendent of schools. Again the independence of the towns asserted itself, and in 1890 the offices created in 1888 were in turn abolished, the town superintendency being restored. A vestige of county unity was retained in a provision whereby the governor and the state superintendent, acting together, were to appoint a county examiner of teachers for each county, but this was finally abolished in 1908. In 1892 the transportation of pupils to school was first authorized. In 1894 a free textbook law was enacted, and in 1898 the first mandatory high school law. Two years later all towns having academies within their limits were also required to provide high school tuition; in 1902 the grading of the high schools of the state was begun, and every town was ordered to provide advanced instruction for its pupils; and in 1906 the high school law, defining and standardizing the schools, and providing for free instruction for all passing certain entrance tests, was enacted. The same year, 1906, state aid to the extent of $20,000 a year was granted for transportation and board of pupils, and in 1910 high school pupils were definitely admitted to share in these grants. In 1904 the superintendent of education and the state board of health were ordered to prescribe tests, to be given in all schools, for sight and hearing. The report of the Code Revision Commission was adopted in 1906, giving Vermont a reorganized school code; a special commission was created to consider the needs of the normal schools and to report at the next session; and the town union supervision law was enacted. In 1908 the superintendent of education was directed to arrange for the certification of all teachers and to fix the standards; an anti-secret-society law was enacted; state aid for manual training courses in high schools was provided; and the old grammar school endowment lands were directed to be used for the support of high schools or academies, or for tuition of pupils in such. Another important law of this year was the re-creation of the state board of education, and the transference to it of the powers and functions of the state normal school board.

Present School System. —At the head of the present school system of Vermont is a state board of education and a state superintendent of education. The governor appoints, biennially, one resident commissioner in each town where a state normal school exists to act in conjunction with the state board of education on all matters relating to the particular normal school. The board acts as a board of control for all of the state normal schools, and for any normal-industrial or industrial school which may be established by the state. The board establishes the course of study for the normal schools, determines the conditions of admission to and graduation from them, issues certificates to those who are graduated, employs all teachers in the normal schools, and reports to the legislature concerning them. The state board also apportions the equalization funds to the towns whose tax rate for schools exceeds 50 cents. The governor, alone, acts as a commissioner for the education and care of the deaf, dumb, blind, idiotic, feeble-minded, and epileptic of the state.

The state superintendent of education acts as the executive officer of the state board of education. He is still elected biennially, by joint ballot of the legislature. He approves all high school or grammar school courses in manual training, and all high school teachers' training classes for the state aid grants; he may conduct educational meeting in the towns and summer schools in the counties; he holds annual conventions with the town superintendents; may prepare and issue a course of study for the elementary schools and the high schools of the state, and may determine the class or standard of any high school or academy; he arranges for all examinations for teachers' certificates, and fixes the standards for the examinations and the certificates issued; he also makes a biennial report to the state legislature.

For each organized town, a board of three school directors is elected. Women may vote for and hold school offices on the same terms as men. Each board of school directors has the care of the school property; appoints its own clerk to keep records, take the school census, and make all reports; employs all teachers and fixes their compensations; makes rules and regulations for the government of the schools; must make an annual printed report to the town clerk, and a report in writing to the annual town meeting, stating the amount of money needed for the ensuing year; if instructed by the voters to do so, he may appoint a medical inspector to examine the pupils in the town schools, and also in any town private school, if requested; may provide kindergartens for children under five years of age, or evening schools; may provide transportation, or pay board, for pupils; must appoint a truant officer, to enforce the compulsory education and the child labor laws; must furnish free all appliances, supplies, and textbooks needed, and may sell textbooks to pupils; and must maintain the schools at least twenty-eight weeks each year. In districts and cities incorporated or organized under special acts of the legislature, of which there are a number, the general school laws apply. Such special districts may vote to include additional territory, and may also vote to surrender their charter and unite with the town educational organization. In the few existing unorganized towns, the law provides for their organization under the district system.

Under the supervision law of 1906, any town having twenty-five teachers may employ a town superintendent of schools, and all towns having thirty teachers must do so. Those towns not thus provided with supervision must unite in supervisory unions, so that there shall not be less than twenty-five nor more than fifty teachers in a union. The town superintendent acts for the state superintendent in giving examinations for teachers' certificates; supervises the schools of the union; directs the work of teachers and pupils; advises the boards of school directors as to the employment of their teachers; prescribes the supplies and schoolbooks which may be purchased; may personally dismiss an unfit teacher; must meet annually with the state superintendent, to consider his work and duties; and must make an annual report to the different boards of school directors of the towns, and an annual statistical report to the state superintendent. The minimum salary is fixed by law at $1250.

School Support. — The recently created (1906) state permanent school fund was valued in 1910, at $1,120,494.25, and at that time produced an annual income of $51,222.65. This fund was constituted by combining the old United States Deposit Fund (*q.v.*) of 1837 ($669,086.79); the Aranah Huntington fund, left by will to the state for schools, in 1877 ($211,131.46); and the Civil War Claim fund of 1904 ($240,000). Of the income from this fund, $15,000, together with $45,000 reserved from the state eight-cent tax for schools, is distributed as an equalizing fund, to the towns paying for schools a local town tax of fifty cents or over, and in proportion to the amount. The balance of the income from the permanent fund, together with the balance of the income from the eight-cent tax, is apportioned to the towns, cities, incorporated districts, and gores, in proportion to the number of legal schools (a school taught by a properly certificated teacher for twenty-eight weeks) maintained. The state also makes special appropriations of $20,000 annually to aid towns expending over fifty cents for school, in providing transportation and board for their pupils; $5000 annually ($250 for each approved school) to high schools or grammar schools offering approved courses in manual training; $300 a year for eyesight and hearing tests; from $12 to $24 per year per pupil, to towns levying over fifty cents for schools, for high school tuition paid ($20,396 in 1910); and from $1000 to $1275 to each supervisory unit for the salary of the superintendent employed ($30,299 in 1910). Old town school lands, estimated as worth a little over half a million dollars, also bring in about $28,000 a year to the towns owning them. Whatever additional money is needed must be raised by the towns, they being authorized to vote any amount needed.

Teachers and Training. — The state employed 3296 teachers in 1910, about ten per cent of whom were men. Approximately 22 per cent of the teachers of Vermont are classed as trained teachers. Of the teachers employed in the elementary schools in 1910, about one half were graduates of academies and high schools, but without training; about one fifth were graduates of academies and high schools, and had received training; and about one eighth had never attended an academy or high school, though four fifths of these had had some normal training. For the training of future teachers the state has maintained, in part, three semi-state normal schools since 1866, but the standards for admission to and graduation from these have been low. They have rendered good service, however, in supplying Vermont with teachers of some professional training. The legislature of 1908 provided for the purchase of one of these and the lease of another by the state, and for the abandonment of the third as a normal school. Teachers' training classes in twelve high schools the first year, and fifteen the second year and thereafter, were provided for at the same time. The certification of teachers is in the control of the state superintendent of education, the superintendents of the towns and unions acting as agents in giving the examinations. Graduates of the normal schools and of normal schools in other states may be certificated without examination. Since 1910, any town may pension any teacher, after thirty years of service, and at one half of the salary of the last five years, on the recommendation of the board, and by vote of the town in annual meeting.

Educational Conditions. — Considering the small wealth and population of the state, the expenditures for education are relatively large. The schools are small and scattered, 80 per cent of the schoolhouses being one-room buildings, and over one half of the schools having less than twenty-five children. One half of the people of the state live in rural districts; only three cities exceed 10,000 population, the largest being approximately 20,000; and but 28 per cent of the 240 organized towns have 2500 population. The population is almost entirely white, and largely native born. Children eight to sixteen years of age must attend school at least twenty-eight weeks each year, and the full school term unless excused by the board of school directors. All children claimed to be physically or mentally unable to attend school may be sent to the school physician for examination. Free schoolbooks and supplies are provided, and children unable to attend school for lack of clothing must be provided with such by the overseer of the poor. The state has a good child labor and female labor law. Any town school superintendent may inquire into the employments of children in the town.

Secondary Education. — The elementary course of study is still made out on a nine-year basis, and the full high school course is four years. Four grades of high schools are recognized, determined by the years of instruction offered. A nine months' term is required. Towns not themselves maintaining a full four years' high school must provide in a high school or academy elsewhere for the instruction lacking. No person can be deprived of the right to attend school because of age. Towns raising a tax of fifty cents or more for education may be reimbursed for high school tuition paid, up to a maximum of $24 a year, and at the rate of one half, if the rate was fifty cents, three fourths, if sixty cents, and all, if seventy cents. A state secondary school of agriculture was created in 1910. In 1910 there were seventy-one public secondary schools and eighteen academies in the state, and of these fifty-seven high schools and fifteen academies offered a four years' course.

Higher and Special Education. — The state maintains no higher institutions of learning of its own. The University of Vermont, at Burlington, includes the State Agricultural College, to which the state makes small annual grants ($13,600). The Agricultural College grants have been given to this institution. Middlebury College, at Middlebury, has recently received a similar grant for a department of pedagogy, to train high school teachers for the state, and for a department of forestry. An additional state grant of $10,000 a year is also made to the University of Vermont in aid of the medical department. Norwich University, at Northfield, has recently been declared to be the military college of Vermont, though "without aid except for scholarships." The above three are all of the institutions of higher learning in the state. The first two are coeducational.

The state also maintains the Vermont State Industrial School, at Vergennes, and in 1910 virtually adopted the Austine Institution for the deaf and dumb, at Brattleboro. The state appropriates $20,000 a year to be expended by the Governor in the education of the state's defectives in the institutions of other New England states, and $2500 additional, to be similarly expended for the proper care of such defectives after their institutional training is ended. E. P. C.

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VERMONT, UNIVERSITY OF, BURLINGTON, VT. — A state institution established by act of state legislature in 1791. The provisions of the original charter were confirmed by an act of Oct. 30, 1838. In 1865 the Vermont Agricultural College, chartered in 1862, was incorporated with the University, which now became entitled to the grants under the Morrill and other acts. The University consists of four colleges: arts and sciences; agriculture; engineering; and medicine, each granting the appropriate degrees. Courses in education, commerce and economics, and home economics are given under the direction of the college of arts and sciences. Short courses are given in the winter by the college of agriculture. A summer session of six weeks is conducted by the department of education. The entrance requirements to the University are those of the New England College Entrance Certificate Board, while for entrance to the Medical College one year of college work in addition is required. The University is beautifully situated on the hill overlooking the city of Burlington and Lake Champlain. The buildings of the University number twenty-five and include the Billings Library, Williams Science Hall, Morrill Hall, the "Old Mill" (the old college building, remodeled in 1883), Converse Hall, the gymnasium, medical building and dormitories. The equipment in natural and physical sciences is good; of especial note is the Pringle Herbarium, one of the most complete collections of the kind in the country.

The faculty consists of 42 professors, thirteen assistant professors, and 34 instructors. The enrollment of students in 1911–1912 was 563 (3, graduates; 180, arts and sciences; 106, engineering; 76, agriculture; 18, special; and 180, medicine). J. F. M.

VERNACULAR, TEACHING IN THE. — Though the language of instruction, in the medieval ages, was Latin (see Latin in the Schools), yet it must have happened in the earliest stages of school work and in the home training, that the vernacular was used. The reading school, the writing school, the song school (see Middle Ages, Education in), were primarily concerned with Latin, and apparently no voice was raised in the Middle Ages for the school use of the vernacular beyond the very minimum of necessity. In the Renaissance times, Erasmus clearly favored the ideal advocated by Laurentius Valla of a single learned language for the world of scholars and "instructed" people.

In 1492, the year of the discovery of America, Antonio de Lebrija (Antonio Calà Harana del Ojo, or in the Latinized form, Antonius Nebrissensis) published a dictionary with Latin-Spanish, and Spanish-Latin. In the same year he also published his *Grammatica Castellana*, and in 1517 his *Réglas de orthographia en la lengua Castellana*. The Castilian grammar was the first grammar of a romance language written by a humanist. About 1506 it was proposed to introduce one of Lebrija's works in the Valencian school, at which the boy Vives (born 1492) was a pupil. Vives joined in the resistance to the proposal, but when he came to write the *De Tradendis Disciplinis*, he had changed his view, and became the first great humanist advocate for the study of the vernacular as the instrument for teaching Latin. Moreover Vives pointed out that the teacher must be skilled in the "peerages of words," *i.e.* he must know the old words and forms of his vernacular, otherwise he will neither read rightly old books in his native language, nor understand obsolete, historical, or etymological knowledge, necessary for teaching in school.

Though the vernacular had been used in Italy by Dante (1265–1321), Petrarch (1304–1374), and Boccaccio (1313–1375), and of course there had been precursors of Dante in early Tuscan poetry, yet it does not seem to have occurred to any writers to advocate the use of the vernacular for the medium of communication between teacher and taught, much less to regard it as a subject of study, until the time of the humanistic Renaissance. The versatile Leo Battista Alberti was proudly attached to his native Tuscan and *c.* 1432–1433 in his *Trattato della cura della Famiglia*, dispensed with the requirement of Latin in the family circle for the promising boy, contenting himself with the use of the vernacular. In his *Della Vita Civile*, *c.* 1435–1440, Matteo Palmieri requires that the child after learning the alphabet should proceed to easy reading in the vernacular up to ten years of age. "It is true," says W. H. Woodward (*Education during the Renaissance*, p. 74), "that no specific place is given in schemes of school study to the grammar of the language or to the great masters of Italian prose and poetry. But every Italian master would be expected to lay great stress upon fluency and refinement in *spoken* Italian." One great difficulty was the number of dialects into which the Italian language was divided and a decisive step forward was taken when Pietro Bembo (*q.v.*) published his Prose (1525) "*nelle quali si ragiona della Volgar Lingua*" as the rest of the title explains. In this book Bembo pleads for the use of the vernacular by men of letters, in spite of the varying dialects which give no certain standard for grammatical correctness or at least no uniformity, and though himself a Venetian, Bembo recommended all scholars to accept the Florentine as the written standard. It is necessary to recognize that grammatical works on the vernacular had already been issued. In 1516 Gian Francesco Fortunio published at Ancona, the *Regole grammaticali della Volgar Lingua*, of which there were at least fifteen editions up to 1552. This was followed in 1521 by Niccolò Liburnio's *Le volgari Eleganzie*, published at Venice, and in the same year the *Compendium della volgar Grammatica* of Marcantonio Flaminio. In 1529 Giovanni Trissino published at Vicenza *La Grammatichetta*, and by 1562 Francesco Sansovino had published at Venice his comparative and critical *Le Osservazioni della Lingua Volgare de' diversi huomini, cioè, del Bembo, del Gabriello, deli Acarisio, et di altri scrittori*. The fact that Castiglione's *Cortegiano*, published at Venice in 1528, was in the vernacular and required good vernacular from the noble and gentleman is significant, when it is remembered that Bartholomew Clerke translated the work into Latin for English readers in the first place as late as 1571 and there were further editions in 1585, 1593, 1612, 1619, and 1713. The Accademia della Crusca had for its object the purification of the Tuscan language. It was founded in 1582.

With regard to the study of French, the curious fact has to be noted that the first French grammars were issued in England, viz. that of Alexander Barclay (London, 1521), *Introductory to wryte and to pronounce frenche*, and the remarkable work of John Palsgrave (*q.v.*), *L'Esclaricissement de la Langue francoyse*, London, 1530, a book which was important for French contemporaries, and is now of high interest for research into old French usage and pronunciation. In 1558 Jean Garnier produced a French grammar, in Latin, at Geneva but for German youth. The first grammar in French appears to have been one entitled *Briefve doctrine pour decrement escrire selon la propriété du langage français* in 1533. Then came the tractates of Robert Estienne, *La manière de tourner en langue française les verbes actifs, passifs, gerondifs, infinis, et participes*, in 1533, and the same writer's *Traité de la grammaire française* in 1557. In 1550 was published at Paris, *Le tretté de la grammere francecoeze*, and in 1562 Peter Ramus (*q.v.*) published, also at Paris, his *Gramere*, in which he made his special appeal with regard to the value of the vernacular.

Ferdinand Brunot (*Histoire de la Langue française*, Vol. II, Ch. 2) traces the revolt against the sole domination of Latin in school studies. He considers that Jean Bodin, the great jurisconsult, was the pioneer in declaring that it would bring about a great economy of time and labor, if all branches of knowledge were studied in the vernacular, as was done by the Romans, and, as he points out, the Italians were beginning to do. Then followed Ramus, Forcadel (in his *Arithmétique*, 1565), and Louis Le Roy, who lectured on Demosthenes in French and instituted a comparison between so-called learned and grammatical languages and living languages (Brunot, II, p. 12). The use of French in schools was greatly promoted by Mathurin Cordier, who strove to bring his pupils to aim at the ideal of *pietas literata*, and regarded the purity and correctness of speech as one of the chief means. Accordingly in his *De Corrupti Sermonis*

Emendatione, in 1530, he supplies a textbook calculated to give pure morals supplied in pure Latin, and with *pure French* renderings. This desire to use pure French when it was used at all was carried by him to Geneva, when he became the Genevan schoolmaster, under Calvin (1509–1564). Calvin himself greatly advanced the position of the vernacular by the translation of the *Institution chrétienne* from his own Latin, 1541. The French Academy was established by letters patent in 1635 (though it had begun meetings in 1629) under the ægis of Cardinal Richelieu. The object was to purify the French language from vulgar, technical, and ignorant usages, and to establish a fixed standard.

In Germany one of the early humanists to show interest in the study of the vernacular was Rudolph Agricola (1441–1485), who was born in Groningen in N. Holland. He thus spoke Low Dutch, to which he added German or High Dutch, French, and the vernacular Italian. He was one of the leaders of the movement for making translations from the Greek and Latin classics into German. But the chief impulse to the development of the vernacular in Germany was given by the Protestant movement. The name of Martin Luther (1483–1546) is associated with the spread of reading the Bible and learning the catechism in the vernacular, and for the achievement of these ends instruction in the vernacular was an absolute necessity. Further, Luther (*q.v.*) introduced the vernacular into public worship and advocated the general foundation of elementary schools in which the mother tongue alone should be the medium of instruction, and he pointed out that the teaching of other languages should follow the course of the acquirement of the mother tongue, which is learned at home, in the market and in the church. "Printed words are dead; spoken words are living."

The influence of studies of Latin and Greek grammar had extended to the vernacular, and German grammars were produced by Valentin Ickelsamer in 1522, and Albert Ölinger in 1573. The reforms, however, which came to German instruction in the vernacular were consequent upon the study of Luther's translation of the Bible (New Testament, 1522; whole Bible, 1534). This is seen directly in the most important German grammar of the sixteenth century, that of Johannes Claijus: *Grammatica Germanicæ Linguæ M. Johannis Claii Hirtzbergensis: ex Bibliis Lutheri Germanicis et aliis eius libris collecta*, 1578. Thus Claijus's German grammar was founded on the German of Luther's translation, but it was actually written in Latin. It was not till 1641 that J. G. Schottel wrote his *Teutsche Sprachkunst*, a comprehensive and important study of the vernacular, a work followed by those of Leibnitz and Morhof. The effective educational claims of the vernacular were made in Germany by Wolfgang Ratichius (*q.v.*) (1571–1635), and J. A. Comenius (*q.v.*) (1592–1670), and institutionally the vernacular formed a marked feature of the *Ritterakademien* of the seventeenth century, while in the universities its introduction is connected with Francke, Thomasius, and Chr. Wolff (*qq.v.*).

In England, the first translation of the Latin Grammar founded on Donatus and Priscian into the vernacular dates back to the A.-S. version by Ælfric the Abbot, *c.* 1000 A.D. It was written "for the little boys of England" and inscribed to them in a simple dedication. In this connection it should be remembered that John Colet's *Æditio* or Latin Grammar of 1527 was in English, but Lily's Grammar (in complete form 1542) made permanent for many generations the Latin grammar in Latin. (See also ANGLO-NORMAN DIALECT; ANGLO-NORMAN SCHOOL BOOKS; ANGLO-SAXON; ANGLO-SAXON SCHOOLS.

The return to English vernacular for educational purposes through the Renaissance study of languages is marked by the publication of Sir Thomas Elyot's *Governour*, the first treatise on moral philosophy and also on education in English. The first important rhetoric was that of Thomas Wilson in 1553. Mr. A. J. Ellis has traced the history of *Early English Pronunciation*, describing the whole of the early English grammars. The difficulty of using the vernacular for educational purposes in the early part of the sixteenth century in England is stated by John Palsgrave in the Dedication of his *Acolastus* in 1540, viz. the fact that schoolmasters spoke such "rude" dialect that they cannot "perfectly open the diversities of phrases between our tongue and the Latin" through ignorance of pure English. Translations into English in the sixteenth century were, therefore, a greater test of the author's knowledge of English than of Latin. The plea for the use of English is associated with Sir Thomas Smith (*c.* 1540), Roger Ascham in the *Toxophilus*, 1545, Wilson in his *Rhetoric*, 1553, Sir John Cheke, 1557, and Richard Mulcaster in the *Elementarie*, 1582. Mulcaster in the *Elementarie* advocates the study in the schools of the English language, "that we should learn to read first that what we speak first, to take most care over that which we use most, and in beginning our studies where we have the best chance of good progress." In the proposed Academy of Sir Humphrey Gilbert (*q.v.*), *c.* 1572, it was laid down that the exercises and orations were to be in English. In this connection should be named the institution of the Society of Antiquaries, founded by Archbishop Parker in 1572, to arouse and maintain the love and knowledge of English antiquities, introducing an interest in Anglo-Saxon and old English language and literature. It was apparently in the private grammar schools that the introduction of English as a serious study first took place. In 1655 John Wharton in his *New English Grammar* pointed out that for *one* boy in a school fit for the university or a learned profession where Latin will be wanted, *a hundred* leave school without such need, " so if they be not bettered in the knowledge of their native language, their labor and cost is to little or no purpose." The first English grammar for the " English-Saxon " (*i.e.* the Anglo-Saxon) was published by a lady, Elizabeth Elstob (*q.v.*), in 1715. F. W.

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VERSIFICATION, TEACHING BY. —

Before the age of the invention of printing, and of wider circulation of Mss., in still earlier times, the oral method of transmission necessarily required all the aids to memory, of verse, rhyme, rhythm, alliteration, etc. Accordingly we find in the oldest civilizations teaching by versification. In China (*q.v.*), elementary education is conducted by means of primers, containing various classics to be learned by heart, " head and body swaying to the rhythm of the book." This is the characteristic oriental method of education.

Literature in General. — The best known historical example is that of the Greeks, for the Homeric poems sprang up as the expression of the garnered stores of history, geography, and general knowledge. By the time of Plato when Homer was learned by heart, as the teacher of life and morals, his influence in transmitting the ideas of half-civilized times was a subject of deep concern, for the Homeric verse embedded itself in the memory, to the exclusion of the new thought and knowledge. Similarly, in Great Britain and Ireland, the Celtic peoples had amongst them learned orders who transmitted from generation to generation their bardic tales, their historical poems and genealogies, with lore of elementary topography, chronology, and family history, all embodied in versification of an artificial and at times a somewhat complicated type. And in early Saxon times the " scóp," who was attached to the court and following the royal custom, was to be annexed in increasing numbers in the halls of the nobles, spread abroad all the traditional knowledge of the age in song and poem, and became by his verses the " traveling geographer and historian," in other words the schoolmaster. In the Anglo-Saxon period, the poems of Cædmon must be regarded as didactic, *i.e.* the recognized and most effective way of conveying to the people the religious teaching of Genesis, Exodus, Daniel, and the struggle between Christ and Satan for the soul, the history of the creation, the fall of the angels, and the story of Judith.

But deeper even than the influence of the literary and peregrinatory scóp and minstrel was that of the folk-lore verse which circulated among early peoples in the form of nature songs, proverb rhymes, nursery rhymes (*q.v.*), game-rhymes, counting-out rhymes, riddle-rhymes, alphabet-rhymes. Sometimes the original genius of the people met the invading civilization and joined it on the common ground of verse; thus apparently some Anglo-Saxon verse-enigmas and riddles were taken or adapted from the Latin *Symposii Ænigmata*, which were in triplets. Besides the contemporary alphabet in verse, the Anglo-Saxons preserved the old runic alphabet and the mystic significance of its letters in Anglo-Saxon verse form, which was printed by George Hickes in his Anglo-Saxon *Thesaurus* and by William Grimm in a treatise on the Teutonic runes (*Ueber deutsche Runen*, Göttingen, 1821).

Arithmetic. — The teaching of arithmetic through verse is very old. Since business arithmetic until recent times was always a matter of mere rule, and since numerous tables necessary in computation must be committed to memory, there was much reason for this method of teaching. A rule or a table put in rhythmic form was more easily memorized than when stated in ordinary language. Thus the nursery rhyme beginning

"One, two, buckle my shoe,
Three, four, bolt the door"

is merely a relatively modern form of counting rhymes that children have learned for centuries. Most of these rhymes have long since been forgotten, but occasionally one is mentioned in literature, as when St. Augustine speaks in his *Confessiones*, of the song " Unum et unum duo, duo et duo quatuor," of his childhood days. One of the places in which rhyme has played a considerable part is in the computus (*q.v.*), where the familiar verses beginning

"Thirty days hath September"

are found. This is a sixteenth-century translation of certain Latin verses that appear in the medieval manuscripts. Such rhymes are found in the works of Josef ben Jehuda in the twelfth century, in the tables prepared by a

Spanish Jew, Chanoch ben Bechai al-Constantini, in 1162, and in treatises by various other writers of that period. Even Stifel (*q.v.*) resorts to verse for remembering the saints' days (*Deutsche Arithmetik*, 1545). In arithmetic, the first popular treatise on the new Hindu-Arabic numerals, written in Europe, was a set of verses by Alexandre de Villedieu, in the thirteenth century, the *Carmen de Algorismo.* In the early printed textbooks, and even more in those of the seventeenth century, verses are often found. Thus Böschensteyn (1514) gives the Rule of Three in this form: —

> "Das mittel mit dem hindern multiplicier
> Dasselbig mit dem vordern Dividier
> Was dir kumbt zu standen
> Hast du der fragenwort gefunden."

Van der Schuere (1600) introduces each chapter of his arithmetic by a verse giving a rule or a statement of the process considered. As an example of the French rhymes, the following from Eversdyck's edition of Coutereel's arithmetic (edition of 1658) gives the rule for $s = \frac{1}{2}n(a+l)$: —

> "Premier & dernier termes adjouteras,
> Puis leur total produict multiplieras,
> Par la moietie du nombre qui les compte;
> Ansi auras ce que leur valeur monte."

The most noteworthy of the English rhyming arithmetics is that of Hylles (1600), who gives all of the rules and many of the definitions in verse. He justifies his method in the following lines: —

> "I am a Booke, whose doctrine consisteth,
> In working with numbers according to Arte:
> The knowledge whereof, to learne who so listeth,
> I promise frankly, to giue and imparte.
> So plainly, so easly, and eke in such sorte,
> That thereof the learoing shall seem but a sport."

In an arithmetic by Richard Chappell, printed in London in 1798, the attempt was made to put the tables in verse, with results like the following: —

> "So 5 times 8 were 40 Scots,
> Who came from Aberdeen,
> And 5 times 9 were 45,
> Which gave them all the spleen."

A little earlier Charles Vyse published a work that became very popular, in which verse problems played a considerable part. The following is a specimen of his work: —

> "When first the Marriage-Koot was tied
>   Between my Wife and me,
> My age did her's as far exceed
>   As three Times three does three;
> But when ten Years, and Half ten Years,
>   We Man and Wife had been,
> Her Age came up as near to mine
>   As eight is to sixteen.
> Now, tell me, I pray,
>   What were our Ages on the Wedding Day?"

How the conditions of the problem were reconciled does not appear in De Morgan, from whom this is quoted. In America it is even yet the custom in many rural schools to sing the multiplication table, and early in the nineteenth century Master Capen, in the old Mayhew School at Boston, had this done to the tune of Yankee Doodle.

Natural Sciences. — More surprising to the modern mind is the exposition of natural science in verse. Of course there were the ancient models of Dionysius: *Orbis descriptio*, in Greek; of Virgil's *Georgics*, of Lucretius: *de Rerum Natura*, and of Manilius: *Astronomicon*, as well as some of the rustic writers, in Latin verse. Amongst such manuals written in French (though by a resident in England) were *Li Livre des Creatures* and the *Bestiarius* of Philip de Thaun, Anglo-Norman poet in the time of King Henry I, and English verses on popular science to be found in the metrical lives of saints (written in the time of King Edward I). The above are reprinted in Thomas Wright: *Popular Treatises on Science written during the Middle Ages, in Anglo-Saxon, Anglo-Norman, and English*, London, 1841. The popular textbook of general science in the age of Roger Bacon and Robert Grostete was the *Image du Monde*, written in French verse in the thirteenth century. Earlier than these, viz. in 1100 A.D., was the standard treatise on medicine and hygienics, entitled the *Regimen Sanitatis Salerni*, dedicated to the English King William II. This treatise in Latin verse retained its reputation right on through medieval times, and the sixteenth and seventeenth centuries, and was again translated into French by Daremberg in 1880. Hastings Rashdall (*Universities of Europe*, I, 82) mentions that to this tractate can be traced the popular *dicta:* —

> *Sex horis dormire sat est juvenique senique*
> *Septem vix pigro, nulli concedimus octo,*

and

> *Post cœnam stabis aut passus mille meabis.*

The communication of knowledge on nature subjects, in verse, through many centuries paved the way for the seventeenth century physical-religious great poems.

It is, probably, not too much to say that John Milton's *Paradise Lost* (1666) had a more extensive influence as a didactic religious poem than as a work of literature in later Puritan times. The same could be said of its predecessor, Du Bartas's *Première Semaine au Création du Monde*, and of Joshua Sylvester's translation, *Divine Weeks and Works*, 1592. The latter indeed almost ranks as a natural science volume, except that knowledge of nature is introduced only as symbolical of some religious interest. Still such works are important in the history of education as combining "every ornament of classic literature and scientific knowledge" in their verses.

Grammars and Vocabularies. — From the beginning of the systematic study of grammar, by the Greeks, it was bound up with the training in the nature of sounds and accents and with quantity and rhythm, and from thence onwards it was recognized up to the time of Horman in the *Vulgaria* of 1520 that "no one can be a grammarian without a knowledge of music," and Charles Butler (himself Master of the Song School at Magdalen College, Oxford) in 1636 said, "Grammar and music should not be parted in the discipline of children." It is not, therefore, surprising that Latin grammars in the Middle Ages were in verse, *e.g.* Alexander de Villa Dei (flourished 1200 A.D.) wrote his grammar as a hexameter poem in over 2600 lines, dealing with accidence, syntax, prosody, etc. In 1212 another famous book in Latin hexameter and elegiac verse was written by Eberhard of Béthune (*q.v.*), entitled *Græcismus:* and the *Florista*, satirized by Erasmus, was also in verse.

One conspicuous Renaissance grammarian Van Pauteren (1460–1520), better known as Despauterius, in his Latin grammar, continued the metrical tradition. The post-Renaissance grammars written in Latin gave the various rules in verse, and this holds of Lily's (*q.v.*) Grammar and of nearly all of the Latin grammars up to the last century, as, *e.g.*, the rules for masculine nouns beginning *Propria quae maribus tribuuntur, mascula dicas*, the past tenses of the verbs of the different conjugations beginning: AS *in præsenti perfectum format in* AVI. After Latin grammars came to be written in English the method was continued in verses such as are still current in: —

A dative put, remember, pray,
After envy, spare, obey.

Even a *Vocabulary*, that of Walter de Biblesworth in French and in English, written at the close of the thirteenth century, for the Lady Dionysia de Monchensi, which consists of a description of the course of the life of the child through all the duties and occupations of life, was written in short rhyming couplets.

In the *Anglo-Saxon and old English Vocabularies* of Thomas Wright (2d ed., 1884, pp. 621 *et sq.*) are given vocabularies of Latin words set out in meter. The Mss. from which they are taken are fifteenth century, but they are probably copied from a still earlier text. John Withals, the author of *A Dictionary for Children* (c. 1554), describes his work as containing phrases both rhythmical and proverbial, and his later editors, Dr. Evans, Abraham Fleming, and William Clarke, added epigrams, histories, poetical fictions, and alphabetical proverbs. In addition, books of construction dealt with collections of epitaphs, characters, emblems, devices, mottoes, hieroglyphics, rebuses, enigmas, aphorisms, paradoxes, quips, anagrams, chronograms, acrostics, and eclogues (which Joshua Poole, *q.v.*, tells us included pastorals, piscatories, nauticals), most of which were in the form of verse. It is only by bearing in mind this training in the reading of such collections and their use in composition exercises, that we can understand the development of English verse-writing. The widespread use of such forms in grammar school education no doubt promoted the appreciation of English poetry in Elizabethan and Stuart times amongst a large proportion of the instructed classes (see RHETORIC, HISTORY OF). The history of the numerous treatises on the art of versification from Aldhelm's *Prosody*, *c.* 700 A.D., to Joshua Poole's *English Parnassus* (1657) would further illustrate the much more important part in the curriculum that verse-making played in the past than in the present (see for practice in Latin and Greek verses, Foster Watson's *English Grammar Schools*, Chapter XXIX).

Like the subjects of grammar, prosody, and rhetoric, logic in some parts was taught by versification. Textbooks still retain the old medieval mnemonic verses to remember the valid and useful moods of the syllogism: —

Barbara Celarent Darii Ferioque priores
Cesare Camestres Festino Baroko secundae, etc.

For further mnemonic verse aids and for bibliography of the subject, see Baldwin's *Dictionary of Philosophy*, Vol. II.

Manners and Morals. — No subject has furnished more scope to verse-instruction than the teaching of manners and morals (*q.v.*). In the moralities of the Middle Ages, some are directly occupied by the praise of learning and the overcoming of the temptations of youth. These are called by Professor F. E. Schelling the "pedagogical moralities" (see his *Elizabethan Drama*, 1558–1642, vol. I, p. 61). In the late Dr. F. J. Furnivall's *Babees' Book*, a collection of "manner" books for the Early English Text Society, the following are all in verse form: *The Babees' Book*, *c.* 1475, *Lerne or be Lewde*; *The A B C of Aristotle*, *c.* 1430; *Urbanitatis*, *c.* 1460; the *Lytylle Children's Lytil Boke*, *c.* 1480; the *Young Children's Book*, *c.* 1500; *Stans Puer ad Mensam* (supposed to be John Lydgate's English translation, *c.* 1460; another version, *c.* 1430; *Of the Manners to bring one to Honour and Welfare; How the Good Wiyf taught her Daughter*, *c.* 1430; *How the Wise Man taught his Son*; Hugh Rhodes's *Book of Nurture*, 1577; John Russell's *Book of Nurture*.

Dr. Furnivall also edited the *School of Vertue*, by Richard Weste, 1619, the *Boke of Curtasye*, *c.* 1430–1440; F. Seager's *Schoole of Vertue*, 1557, together with ten French and Latin poems. Dominic Mancinus (*q.v.*) wrote on the *Four Cardinal Vertues* in Latin verse, and this was translated into English verse, by Alexander Barclay in 1523. One of the chief of these textbooks for morals was the collection of poems, viz. of Cato's *Distichs*, *Sayings of the Seven Wise Men of Greece*, and of Publius's *Stage-Verses* or Seneca's *Proverbs*, of which Charles Hoole edited a text and supplied an English translation in 1659. Perhaps no treatise on manners and morals was more universally known in the seventeenth century than the Latin verses *de Moribus* furnished by William Lily for the boys who studied the authorized Latin Grammar. Edmund Coote, in the *English Schoolmaster*, 1596, laid down the rules of behavior in nine quatrains in English. In 1715 Isaac Watts published his *Divine and Moral Songs* which, in spite of much adverse criticism, had a great influence on the nurseries of the past, when sympathizers with child life were not so numerous as to-day. John Bunyan, a little earlier, viz. in 1686, wrote a much less known book, *A Book for Boys and Girls; or Country Rhymes for Children*, his verse-introduction to encourage the backward child, ending:

> Some boys with difficulty do begin,
> Who in the end, the bays and laurel win.

History. — History long remained under the thraldom of verse-methods of instruction. The old Greek and Latin epic poems were the models, and Cædmon's poems in Anglo-Saxon passed on the tradition which survived into and after the Renaissance period. In 1580 John Hyrd of Lincoln Grammar School wrote a *Historia Anglicana* in Latin verse. In 1582 Christopher Ocland (*q.v.*) published the *Anglorum Prælia* in Latin hexameters, a book ordered by the Privy Council to be read and taught in all grammar and free schools, and there can be no doubt it was intended to be learned by heart. In 1621 was published *Palæ-Albion. The History of Great Britaine from the first peopling of this Island to this present raigne* of King James I, by William Slatyer. This is a small folio of 300 pages, containing the history of England in Latin verse on the left hand and a translation into English rhyming verse on the right hand.

In the eighteenth and nineteenth centuries a vast number of textbooks of the Peter Parley type taught history and geography by rhymes. G. J. Cuckow, of the Market-Place Academy, Boston, in 1838 published *Our Native England or the Historical House that Jack Built*, written in familiar verse with forty-seven woodcuts, beginning: —

> These (with an illustration) are the Britons, a barbarous race,
> Chiefly employed in war or the chase,
> Who dwelt in our native England.

In the earlier period of public examinations for the secondary schools, many historical and geographical jingles were put into circulation. A recent example is *Historical Rhymes for the Young*, by "Sir Reed Gooch Baggorre," 1909, somewhat similar to the old type: —

> In 43 a Roman host
> From Gaul assailed our Southern coast.

Rhymes were used extensively in connection with girls' samplers, often finished with a tag such as: —

> This is my work
> So you may see
> What care my mother
> 'As took of me.

Chronology has been a favorite subject for mnemonic verses. Hooke, the Roman historian, wrote a series of verses for dates in ancient history and in 1833 an anonymous author composed a somewhat elaborate *Poetical Chronology of Ancient and English History.*

Religious Instruction. — From the Anglo-Saxon times, versified methods of instruction were continuously employed until the fifteenth and sixteenth centuries. Religious instruction, *e.g.* the Ten Commandments, the Creed, the Paternoster, the Ave Maria, and the church doctrines, were thrown into verse form, and so taught. Erasmus devised such a metrical form, and in this way they are even still taught in some places abroad. Miss A. T. Drane (*Christian Schools and Scholars*, 2d ed., 1881, p. 546) describes a medieval primer, quoting from a Ms. poem, each portion of which begins with a separate letter of the alphabet. But after elementary religious instruction had been given in verse, other subjects were similarly treated. Thus a versified geography of the fourteenth century is extant, beginning: —

> This world is delyd (divided), up in three,
> Asie, Affrike, and Eu-ro-pe.
> Wot ye now here of A-si-e,
> How mony landes ther inne be?

In the article on blackboards (Vol. I, p. 391 of this Cyclopedia) the Nuremberg School regulation (1500) is quoted, in which children were required to learn, each night, a Latin verse, maxim, or proverb, and with it two German verses "rhymed or unrhymed, according to the Latin meaning." In 1570 the first English-printed writing book, that of John De Beau Chesne, contained the rules for teaching good writing, drawn up in English verse, a practice which is to be found still later.

Mr. E. K. Chambers has pointed out (*Medieval Stage*, Vol. II, p. 212) that the exercise of reciting verses had not ceased from the time of the Roman Empire, and he cites the transition stage of the dialogue in verse form of the *Ludus Septem Sapientium* of the Bordeaux schoolmaster Ausonius in the fourth century. The oral school verse methods helped the dramatic impulse, and *vice versa*. This is of importance in considering the educative effect of the mysteries and moralities.

Many summaries of the Bible were provided in verse, one of the best known being Samuel Wesley's *History of the New Testament* in 1717. Mr. Clifton Johnson's *Old Time Schools* devotes chapter III to the *New England Primer*, and furnishes examples of the rhyming alphabet. In the latter half of the eighteenth century in England, W. Rusher of Banbury issued his *Reading made Easy*, which passed through

300 editions by 1830. This contained the rhymed alphabet beginning: —

"A was an Acorn that grew in the oak," etc.

This is probably not so old as the rhymed alphabet which begins: "A was an Archer that shot at a frog," etc., which Mrs. E. M. Field (*The Child and his Book*, 2d ed., p. 192) traces to Thomas White's *Little Book for Little Children*, written in 1702.

In the Middle Ages, before beginning work a blessing was to be asked in verse,

"Christ's Cross be my spede
In all vertue to proceed."

The oldest English reading book known is the *Dives Pragmaticus*, "a book in English meter, of the great merchauntman called Dives Pragmaticus, very pretty for children to reade," published in 1563. It begins: —

I have inke, paper, and pennes to lode with a barge
Primers and abces, and books of small charge,
What lack you scollers? Come hither to me!

F. W. and D. E. S.

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VERTICAL WRITING. — See Penmanship.

VERTIGO. — A feeling of dizziness, sometimes accompanied by falling, with peculiar sensations or feelings of swimming of the head and of the eyes. Stationary objects apparently move, the direction depending upon the eye movements. This condition is a symptom in a number of diseases. It is found commonly associated with other symptoms in diseases of the cerebellum and of the internal ear; it is also found in epilepsy, usually previous to a convulsion, and sometimes accompanies hysteria and neurasthenia; it is also a common symptom in cases of brain tumor.

There are some who say that vertigo in its true sense is not found in hysteria and other functional conditions, but that it always indicates a grave disorder of the cerebellum or of the internal ear. The symptoms are all referred to pressure or to other changes taking place in these regions. On account of this, suspicion of cerebral or intracranial disease is present whenever vertigo is found. The condition should make the teacher suspicious, and should lead to a careful examination of the child, since if it is due to disease of the brain it may be relieved by operation if early attended to.

A condition like vertigo may be produced by rapidly swinging the individual around the body axis a number of times, the number of turns depending upon the individual. We find the symptoms increasing from the confused swimming of the head to those of dizziness and the apparent movements of objects in certain directions and the actual inability to control the body so that it remains erect. The latter vertigo-like conditions are produced largely by stimulation of the semicircular canals in the internal ear. S. I. F.

VESTIGIAL INSTINCTS. — See Instincts.

VESTRIES AND EDUCATION. — See Reformation and Education.

VICES OF CHILDHOOD. — See Education and Crime; Moral Instruction.

VICO, GIOVANNI BATTISTA (1668–1744). — Italian philosopher and founder of the so-called philosophy of history. He was born and educated at Naples, where after the year 1697 he was professor of rhetoric in the university. His philosophy of history is developed in a treatise on the "Principles of a New Science of the Common Nature of Nations" (1725). Other works are *De Ratione Studiorum* (1708), *De Antiquissima Italorum Sapientia* (1710), *Jus Universale* (1720).

There is a common principle which underlies the eternal order of the universe and the judgments, customs, and experiences of men. This all-embracing principle is God. The basis of all history is the ruling power of divine providence through which men by their own free activity progressively realize the idea implicit in human nature. Man thus rises from a crude condition, not far above that of the brutes, by progressive steps to the highest stage of civilization. Driven by the terrifying phenomena of nature men and women forsake their wild wandering in the forest and, taking refuge in caverns, form families. Civilization now advances according to certain laws; its abode passes from hut to village, to city, to academy; religion, marriage, social customs, language are developed. The progress of civilization passes through three well-marked stages, — the divine (represented by theocracy), the heroic (aristocracy), and the human (democracy and monarchy). Each of these has its characteristic type of language, law, morality, and religion. In the human stage government takes the form of aristocratic or democratic republics, and modern monarchies, recognizing more or less the equality of the people; here religion tends towards morality, and public and private right are distinguished. Increase of wealth tends to inequality; and corruption, abuse of power, and civil wars follow, from which monarchy may arise as a guarantee of order, but the nation may become disrupted and fall into a state of decadence, from which evolution must begin again. This is the story, not only of antiquity, but of all the nations in particular, and of civilization in general. The progress of any nation, from brutal force to law, from authority to reason, from individualism to democracy, is not imposed by authority, or borrowed from other nations, but is a spontaneous growth from inner impulses under the influence of environment.

S. W.

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VICTORIA COLLEGE, TORONTO, CANADA. — A coeducational institution, founded by the Methodist Conference in 1836 as the Upper Canada Academy and located at Cobourg until 1892. A college charter was obtained in 1841 and in 1883–1884 the college obtained the status and name of a university. In 1892 it was affiliated with the University of Toronto and removed to its present location. Courses are offered in arts and theology; the students take the examinations and degrees of the University of Toronto, Victoria College holding in abeyance her right to confer degrees in arts, law, and medicine. Theological degrees, however, are conferred by Victoria College, after a three years' course, on candidates who must be graduates in arts of at least two years' standing. The enrollment in 1910–1911 was 599.

VICTORIA, EDUCATION IN. — See Australia, Education in.

VICTORINUS. — Neoplatonic philosopher, rhetorician, and Christian theologian, born toward the end of the third century in Africa. His importance in the history of education is due to the fact that he was the most celebrated teacher of his time at Rome, having even received the honor of a public statue in the Forum of Trajan. He was the translator of numerous works by Aristotle and the Neoplatonists, which for a time played an important part in the general philosophical education of the West, and also was the author of several works of instruction. He also enjoys distinction as a Christian theologian; for about the year 357, after having for some time secretly favored Christianity, he made public profession of that faith. An affecting account of his conversion is given by Augustine in his *Confessions* (Bk. VIII, c. 2 ff.). Augustine himself had been brought to Christianity partly by the translation of Victorinus. These works are unfortunately lost. The theological works of Victorinus may be found in Migne's *Patrologia, Series Latina*, Vol. VIII. Several of his rhetorical works and philosophical commentaries have been preserved; for editions see Teuffel-Schwabe, *Geschichte der Römischen Litteratur.*

J. C. A., Jr.

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VIENNA EXPOSITION. — See Expositions, International, Education in.

VIENNA INTERNATIONAL CONGRESS OF EDUCATION. — See International Congresses of Education.

VIENNA, IMPERIAL ROYAL UNIVERSITY OF. — Established in the year 1365 under Duke Rudolf IV. The papal bull of Urban V, being dated June 18, provided for only three faculties, the theological faculty not being added until 1384 under Pope Urban VI and Duke Albrecht III. The institution owed its origin to the desire of Duke Rudolf to establish a competitor in his own country to the Bohemian University of Prague (1348) and the Polish University of Cracow (1364). Unfortunately the duke died soon after the foundation of the University, and his extensive plans for the development of the institution were ineffective, the University, which in reality consisted merely of a faculty of arts, leading a rather precarious existence for a number of years. With the establishment of the theological faculty in 1384 a complete reorganization took place under Henry von Langenstein, a Hessian theologian, who had been called from Paris. The Paris system of four nations was adopted by the new institution, the division at Vienna being into Austrian, Saxon, Bohemian, and Hungarian. The University increased gradually in power and prestige and by 1520 it enjoyed the distinction of attracting the largest number of students of all the German universities, but as a result of the Reformation the institution received a severe setback, there being only thirty students enrolled in 1530. The Jesuits established themselves at Vienna in 1551 and soon founded a college, which was later incorporated with the University. In 1623 the institution was turned over to the Jesuits by Ferdinand II and for over two hundred years thereafter the University did not flourish. It was not until extensive reforms had been undertaken (1848–1850) by Feuchtersleben, Exner, and Count Leo Thun that the institution entered upon a new era of prosperity, which it has enjoyed ever since. The faculty of medicine stands particularly high, not only in Europe, but also in America, and the opportunities for clinical work at Vienna are excellent. A new main building was erected in 1755, which is now used by the Imperial Academy of Sciences, while the present splendid main building dates from the year 1884. Vienna is the largest university in Austria-Hungary in point of student enrollment, and is exceeded in size by only one German university, Berlin. During the winter semester of 1910–1911 there were 9580 students in attendance, of whom 1579 men and 422 women were auditors. The matriculated students were distributed as follows: theology (Catholic), 219; law, 3418; medicine, 1868; philosophy, 2074. The library, founded in 1775, contains about 850,000 volumes, including 663 incunabula and 906 manuscripts. The Imperial Royal Library, founded in 1740, contains over a million volumes, including 8000 incunabula, also 27,000 partly extremely valuable manuscripts, 20,000 maps, 350,009 engravings, 30,000 autographs, over a hundred thousand papyri, etc. Vienna is also the seat of a school of technology, which was founded in 1815 and served as a model for the German schools (3239 students in 1910–1911); a school of agriculture and forestry (1872); a school of commerce (1898); an academy of art (1692); a consular academy (1754); a school of veterinary medicine (1777); an Evangelical (1821), and a Jewish theological seminary (1893); and a school of Oriental languages (1851, 1873). The natural history museum contains one of the most extensive zoölogical collections in the world. R. T., Jr.

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VIÈTE, FRANÇOIS. — Known also as Franciscus Vieta (1540–1603), one of the most influential writers on algebra in the sixteenth century. Although educated for the law, he spent most of his time in the public service, devoting his leisure to the study of mathematics. Viète wrote several works on mathematics, including the *In Artem Analyticam Isagoge* (1591), *Supplementum Geometriæ* (1593), *De Numerosa Potestatum Resolutione* (1600), and *De Æquationum Recognitione et Emendatione* (posthumous, 1615). His works were republished by Van Schooten in 1646. He was the first notable writer on symbolic algebra, his predecessors having made relatively little use of symbolism. Although his plan was short-lived, being soon replaced by that of Descartes (1637), it had a great deal of influence on the science of algebra. D. E. S.

VILLANOVA COLLEGE, VILLANOVA, PA. — A Catholic institution founded in 1843 under the control of the Fathers of the Order of Hermits of St. Augustine. A preparatory school, college of liberal arts, and schools of technology and commerce are conducted. The entrance requirements are those established by the regents of the University of the State of New York. The degrees of A.B. and of B.S. in engineering are conferred. The total enrollment in 1911–1912 was about 350. The faculty consists of thirty-five members.

VILLEMAIN, ABEL FRANÇOIS (1790–1870). — French historian, teacher, and publicist. He taught at the Lycée Charlemagne and at the École normale, and was subsequently appointed to the professorship of French eloquence at the Sorbonne. He was elected Academician in 1821, later becoming secretary of that body, and was chosen Deputy in 1830. He was a member of the Higher Council of Education and was Minister of Public Instruction in 1839–1840, and 1840–1844. Among his writings may be cited: *Histoire de Cromwell* (1819); *Cours de la Littérature française* (5 vols., 1828–1829); and *Souvenirs contemporains* (2 vols., 1856). F. E. F.

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VINCENNES UNIVERSITY, VINCENNES, INDIANA. — Organized in 1806 under warrant given by the United States government with General William H. Harrison the first president. Congress voted a township of land, the territorial legislature granted the trustees a charter, and within a few years the University was instructing students under the presidency of Dr. Samuel Scott. Political jealousies resulted in the seizure of lands. Thus handicapped, the University continued through fifty years of poverty. Only in 1911 was the institution successful in receiving from the state legislature in lieu of the original seizure the sum of $125,000. To-day the institution maintains departments of literature and science, music, art, household science, business, oratory, normal, and preparatory. The institution is nonsectarian and coeducational. Students are admitted on showing ability to take up the courses. The enrollment in 1910–1911 was 323. The faculty consists of twelve members. H. E.

VINCENT OF BEAUVAIS (*c.* 1190–1264). A thirteenth century scholastic philosopher, and member of the Order of St. Dominic. (See DOMINICANS AND EDUCATION.) Little is known about the life history of Vincent except that he studied in Burgundy, entered the order of St. Dominic, became tutor and "reader" in the household of King Louis IX of France, and died about the year 1264. In the royal library at Royaumont he found an abundance of material for his comprehensive literary plan, which was to compile an encyclopedia of all the sciences, arts, and literatures which were then known to the Latin Christian world. This educational scheme was entitled *Speculum Magnum*, one of a long series of medieval "mirrors," such as the *Mirror of Perfection*, the *Mirror for Princes*, etc. He lived to complete three parts of the work; namely, *Speculum Historiale*, *Speculum Naturale*, and *Speculum Doctrinale*, which treated of history, natural science, and philosophy and theology. Vincent was not an original thinker. He did distinguished service, however, to the cause of medieval education by his orderly, systematic arrangement of the doctrines and writings of his predecessors and contemporaries. W. T.

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VINCENTIANS, THE, OR LAZARISTS. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

VINET, ÉLIE. — See RENAISSANCE AND EDUCATION.

VIRGINIA CHRISTIAN COLLEGE, LYNCHBURG, VA. — A coeducational college established in 1903. An academy, college, and schools of the Bible, fine arts, expression, and domestic science are maintained. The entrance requirements are fifteen units. The degrees of B.A. and B.S. are conferred. The enrollment of students of collegiate rank in 1912–1913 was about 140. The faculty consists of fourteen members.

VIRGINIA MILITARY INSTITUTE, LEXINGTON, VA. — See PRIVATE SCHOOLS.

VIRGINIA, STATE OF. — The oldest, in point of settlement, of the thirteen original states of the American Union. It is located in the South Atlantic division, and has a land area of 40,262 square miles. In size it is about as large as Ohio or Kentucky. For administrative purposes the state is divided into 100 counties and 19 cities, the counties being further subdivided into 545 school districts. In 1910 Virginia had a total population of 2,061,612, and a density of population of 51.2 persons per square mile.

Educational History. — In 1618 some proposals were made for a college in the colony, with some preparatory schools attached, but the Indian massacre of 1622 put an end to the idea, and nothing more was done until the establishment of the College of William and Mary (*q.v.*), in 1693. This college for a long time stood alone in the state, representing the old-time aristocratic life of the colony, and offering advanced instruction. The lower preparatory branches were supplied by ministers, tutors, and other types of voluntary instructors. In 1749 Washington and Lee University had its beginning in a Presbyterian academy, being chartered in 1782 as Liberty Hall, later as Washington Academy, and then as Washington College. In 1776 another Presbyterian academy began, which in 1783 was chartered as Hampden-Sidney College. This covers the efforts to provide education, aside from private means, made during the colonial period.

The first state constitution was framed in 1776, but this was silent on education. The same was true of the second constitution, framed in 1830. In 1779 the first important bill for the establishment of a school system, framed by Jefferson and Wythe, was proposed, but failed of passage, and nothing further was attempted for seventeen years, when Virginia's first school law was enacted. The bill of 1796, entitled "An act to establish public schools," marked the beginning of educational legislation for common schools, but the purposes of the bill were defeated by its optional character, and little or nothing was accomplished under it. After certain formalities had been carried out, a board of three, known as aldermen, were to erect a schoolhouse, appoint the teacher, and admit all free children to the school for three years free, and thereafter on the payment of tuition. Reading, writing, and common arithmetic were to be taught at all such schools, and the aldermen were to visit them once in six months to examine the pupils, and were to superintend the teacher and the school. The salary of the teacher, together with the expense of erecting and maintaining the schools, was to be paid by a tax levied on the county as a whole. The mayor, aldermen, and councils of the different incorporated boroughs were to have similar control of their schools. How far this optional school law was carried into effect is not known, but certainly little was done under it.

In February, 1810, the "literary fund" was created, and in 1815 this was made a reality by the addition of a large sum of money due the state from the national government. The control of the fund was placed under a rudimentary state board of education, termed a Board of Trustees of the Literary Fund. By 1816 the fund had reached a value of $1,000,000, and the board of trustees was asked to report a bill to the legislature for the organization of "a system of public education, including a university, to be called the University of Virginia, and such additional colleges, academies, and schools as should diffuse the benefits of education throughout the commonwealth." The board reported a bill in 1818, which was adopted by the legislature. This was the second Virginia school law. Instead of the system of public education asked for in the resolution, the bill provided merely for a charity school system. In each county, city, and town the courts were to appoint school commissioners, who were to determine how many poor children they would educate, and what sum they would pay for their education. Each commissioner was to select a certain number of children, who were to be sent to the most convenient school, to be taught reading, writing, and arithmetic. The sum of $45,000 annually was appropriated from the income of the literary fund, to be apportioned and used for this purpose. In 1821, colleges, academies, and intermediate schools were permitted to share in the grants for the education of poor pupils, and in 1829, two fifths of the cost of building a schoolhouse was permitted to come from the Fund. In 1843 the governor, in his message to the legislature, said that the result of nearly thirty years of effort was the provision of sixty days of schooling for about half of the indigent children of the state, and that this costly and inadequate system ought to be abolished and a better one substituted. The only other educational efforts of importance made during this period were the chartering of the University of Virginia in 1819, its organization in 1824, the creation of the state institution for the deaf and dumb, in 1838, and the opening of the Virginia Military Institute, an institution modeled after West Point, in 1839.

The messages of Governor Campbell, from 1837 to 1849, constantly urged better educational conditions and laws. In 1841 three conventions of the friends of education were held, to try to secure school reform. Reports were submitted, and a district free-school system was recommended. The legislature was memorialized, and an address was made to the people. The result was a bill, which disappeared after its second reading, and no further action for four years. Finally, in 1846, the third Virginia school law was enacted, and this continued in force until the Civil War swept the old system aside. The law provided for boards of school commissioners, who were to meet and lay the county off into school districts, and in each district a school was to be established for instruction in reading, writing, and arithmetic, and, where practicable, such higher elementary school branches as the school commissioners might direct. All resident white children, above the age of six, male or female, were to be admitted free, and the cost of maintaining such schools, above that provided by the income from the literary fund, was to be met by a county school tax. Had this law been mandatory, it would have accomplished much, but, like the law of 1796, it was optional with the counties to accept or reject it, and the result was failure. The pauper school law of 1818, with amendments, virtually continued to be the school law of the state. Only nine counties adopted the new law.

The new constitution of 1851 made the first mention of education, by providing for a capitation tax on white persons for "the purposes of education in primary and free schools." In the revision of 1864 this provision was continued unchanged. During the period preceding the Civil War a constantly increasing number of secondary schools was established at various points within the state, and some of these were distinguished for the character of the instruction offered. Three hundred and seventeen academies, with 547 teachers and 9068 pupils, were reported in 1850. The University of Virginia was a noted institution in the days before the War, and its instruction was supplemented by William and Mary, Hampden-Sidney, Washington, Randolph-Macon, Emory and Henry, Richmond, and Roanoke colleges, all of which were distinguished institutions before 1860. The educational system of Virginia remained essentially aristocratic during all this period.

The new constitution of 1869 made detailed provision for the creation of a real state school system. This provided for the election of a state superintendent by the legislature, and for an *ex officio* state board of education. The state superintendent was to report to the legislature a plan for a uniform system of free public schools, which, when approved by the legislature, was to be introduced into all counties by 1876. The law of 1870, the work of Dr. Wm. H. Ruffner, carried the constitutional provisions into effect, and the first report of the state superintendent was issued in 1871. In 1872 the State Agricultural and Mechanical College for whites was founded, with a branch for colored students at the Hampden Normal and Industrial School.

The work of the next thirty years was the establishment of the new school system thus created. Starting at a time when Virginia had hardly begun to recover from the devastating effects of the Civil War, and with no strong public educational sentiment in the past history of the state to help forward the new system, it took years for it to establish itself in the minds of the people and for it to secure the necessary financial support. The growth was steady, but slow, and the system was so good that no important changes were needed for many years to come.

In 1901 a new state constitution was framed, and in this the article on education was somewhat expanded and improved. The state board of education was changed from three to eight, and its functions materially increased; largely increased state and local taxation was provided for the schools; an efficient system of public free schools was ordered maintained throughout the state; mixed schools and aid to any non-state school were prohibited; and the establishment of agricultural, normal, and technical schools was authorized. The next year the school code was thoroughly revised in harmony with the new constitutional provisions, though the old framework remained. The great need of the schools was not so much new laws as new interest and support, and in 1903 the Virginia Coöperative Educational Commission was formed. This movement culminated in the great state-wide educational campaign of May, 1905, in which more than one hundred leading citizens made educational addresses in all parts of the state. The result of this educational revival was shown in the legislature of 1906, when largely increased state and local appropriations for schools were made. Other movements of significance were the creation of a state board of examiners, with uniform standards and examinations for teachers' certificates throughout the state, in 1904, and the organization of the Virginia Educational Conference, in 1906, to continue the propaganda for schools. In 1908 teachers' training classes were authorized, and state aid for them was voted; agricultural classes were authorized, with state aid for them; and two new state normal schools, at Harrisonburg and Fredericksburg, were established. In 1910 the agricultural school bill was amplified, and such schools were put under the control of the state board of education; a new state normal and industrial college for women was established, at Radford; the state board of health was directed to formulate rules and regulations for the proper sanitation of schoolhouses; a rural and public school library bill was enacted; and a united agricultural board, for the direction and control of agricultural education, demonstration, and experiment work, was created. An educational commission, to devise methods of management for the different educational institutions, and to formulate a plan for the higher education of women in the state, was also created, and made its report in 1912.

Present School System. — At the head of the present state school system of Virginia is a state board of education, possessing large powers, and a state superintendent of public instruction, who acts in large part as the executive officer of the board. The duties of the state board of education include the division of the state into school divisions, and the appointment of division superintendents for each, subject to confirmation by the senate; the assignment of duties to the state superintendent, and to the division superintendents; the adoption of by-laws, and rules and regulations for the government of the schools, which have the force of law until disapproved by the legislature; the appointment of a state board of examiners, and control of the certification of teachers, by the formulation of standards; the appointment of state school inspectors, to examine the schools and to report to the board; the selection of textbooks, appliances, and furniture, for use in the schools of the state; the investment of the state literary fund; the making of rules and regulations for the management of traveling libraries; to prevent, by proper regulations, the unnecessary multiplication of small schools; to make loans from the literary fund to districts for school building purposes, when applications are approved by the state superintendent; to designate the high schools in which teachers' training classes may be organized, and to approve the state aid for them; to act as a board of control for the Virginia Normal and Industrial Institute for colored students; to establish courses in agriculture, domestic arts and science, and manual training, and to designate the centers for demonstration work; to administer the special appropriations for aid to rural graded schools, school libraries, and the equipment and improvement of agricultural high schools; the observance and regulation of the school system; the making of a biennial report to the legislature; and the performance of any additional duties which may be assigned to them by the legislature.

The duties of the state superintendent are laid down by regulations of the state board of education, instead of in the general school law. He is to act as the executive officer of the state board of education, and as the chief executive of the public free school system of the state; to see that the school laws and the rules and regulations of the state board are faithfully carried out; to interpret the school laws, decide appeals from the division superintendents and county trustee boards, and to explain their duties to all subordinate officers; to strive to promote an appreciation of and a desire for education among the people of the state; and annually to lay before the state board a detailed report showing the condition of education in the state.

For each county and each city, called divisions, a division superintendent is appointed by the state board of education, and confirmed by the senate. The powers and duties of these division superintendents are fixed by the state board of education, and they must follow the directions and regulations prescribed by the state superintendent. They make monthly and annual reports to him; act as agents for the state board of examiners, in the matter of the certification of teachers; apportion the school funds to the districts; enforce rules, regulations, decisions, instructions, and textbooks, as adopted or laid down; approve all plans for the erection of schoolhouses; receive proper reports from school officers; hear and decide controversies; visit the schools and advise with school officers; conduct a county teachers' institute; and serve *ex officio* as a member of the school trustees' election board for the county, and of the county board of education. The school trustees' election board for each county is charged with the duty of annually appointing one school trustee for each school district of the county (cities excepted, where the three trustees are appointed by the council), with the further right to remove any trustee from office; and of the hearing appeals from the decision of the district superintendent. The county board of education for each county is composed of the district superintendent, *ex officio*, together with all of the district trustees of the county, appointed as above. These boards range from ten to thirty-four in membership, with an average of about eighteen to twenty. The board may appoint its own clerk, and must make an annual report to the state superintendent. It is the duty of this board to estimate annually the amount of money needed for the schools for the ensuing year; and to apportion the county school money to the districts in such a manner as to maintain as nearly equal terms in all schools as possible. The board may hold funds and lands; may sell or exchange school property; and has a certain supervision of the accounts of the school districts of the county.

Each county is divided into from three to ten school districts, with an average of five and one half. There are also nineteen cities and towns under special school boards and division superintendents. Towns of 500 inhabitants may be placed under separate control, if the town council so desires. For each school district a district school board of three trustees is appointed. The duties of these district school boards include the interpretation and enforcement of the school laws; the enactment of rules and regulations for the government of their schools; the employment, assignment, and dismissal of teachers, and the fixing of their salaries; the admission, suspension, and expulsion of pupils; the visitation of the schools under their charge; the provision of textbooks for indigents; the provision of suitable schoolhouses, with proper furniture and appliances; the preparation of an annual estimate of the amount of school money needed for all purposes; and the making of an annual report to the state superintendent. These district school boards may hold the title to all school property of their districts, and are empowered to lay off the district into suitable school districts for the white and the colored children.

The law also permits a still further subdivision, whereby any county board of education, by vote, may decide to divide the districts into a subdistrict for each school, and the district system (*q.v.*) of school administration is then in use. Any county board of education, in a county in which the subdistrict system exists, may appeal to the state board of education for relief, and this body is authorized to restore the larger district system.

School Support. — The income from the literary fund; $1 of a state capitation tax, levied on all males, not pensioned by the state; a state school tax of one mill; and a large annual appropriation made by the legislature ($500,000 in 1911–1912), together constitute a fund which is apportioned by the state board of education to the counties and cities, in large part on the basis of the number of children in each of school census (7–20) age. The salaries of the division superintendents, and $25,000 for aid to rural two- to four-room graded schools, is first deducted from the appropriation. A state appropriation of $100,000 for aid to high schools, of which $30,000 must be used for instruction in agriculture, domestic science and art, and manual training in the ten congressional district agricultural high schools, is also made; $25,000 was also granted (1911–1912) for the improvement and equipment of these agricultural schools; $5000 for school libraries, $7500 for traveling libraries, $5000 for teachers' pensions, and $15,000 for normal training classes in the high schools were also appropriated this same year. Of the total school revenue, 40 per cent came from state sources. The supervisors of each county may also levy such taxes for schools as they see fit, from one to four mills, and districts may further supplement the county taxes, though the total county and district taxes combined cannot exceed five mills, except by vote of the people.

Teachers and Training. — The state employed 10,093 teachers at date of last report, 20 per cent of whom were men, 23 per cent of whom were colored, and 19 per cent of whom were graduates of a college or normal school. Of the last group, 16 per cent were colored teachers and 21 per cent were white. For the training of future teachers of the colored race the state maintains a normal department in the Virginia Normal and Industrial Institute, to which division superintendents are authorized to appoint two times as many students as there are representatives in the lower branch of the legislature from the county. At least 100 colored students must also be provided for at the Hampton Normal and

Agricultural Institute. A number of private and denominational institutions for the negro race also contribute to the supply. For the training of white teachers similar appointments are made to the College of William and Mary, the State Female Normal School, the Virginia Military Institute, the new (1908) state normal schools at Harrisonburg and Fredericksburg, and the new (1910) state normal school and industrial college for women at Radford. In addition, high school training classes for the preparation of teachers for the rural schools were authorized in 1908, and a number of such classes have been formed and approved. About a dozen four weeks' summer normal schools for white teachers, and four or five for colored teachers, are also conducted each year, and a teachers' reading circle is maintained. A compulsory statewide pension system, administered by the state board of education, and supported in part by state appropriations, and in part by a 1 per cent salary deduction, now exists for all teachers.

Educational Conditions. — The state is largely rural, and the educational problems are still largely those relating to the rural and the small town school. Seventy-seven per cent of the population of the state lives in rural districts, while 20 per cent of the population is found in the ten cities of the state having over 10,000 population. Approximately 70 per cent of the total population is white, and the white element is increasing much faster than the colored. There are very few foreign-born in the state. The state is still relatively poor, and the expenditures for education are still much below the average for the United States as a whole, though there has been a marked increase in expenditures since the educational campaign of 1905. School libraries and traveling libraries have recently been begun.

Secondary Education. — The high school has experienced a marked development in Virginia since the enactment of the high school act of 1906, and the further aid extended in 1908 for training classes and instruction in agriculture, manual training, and domestic economy. In 1912 there were 432 high schools in the state, about 75 of which are fully accredited. Three-year and two-year high schools are also recognized, and constitute three fourths of the total number. The high school course covers the eighth to eleventh years. Five public and twenty private and denominational schools and colleges, many normal and industrial in type, offer secondary instruction for the colored race.

Higher and Special Education. — The University of Virginia (*q.v.*), at Charlottesville, stands as the culmination of the public school system of the state. The College of William and Mary (*q.v.*), at Williamsburg, is also recognized as a state college and a state normal school for men. The Virginia Polytechnic Institute (*q.v.*), at Blacksburg, is the state agricultural and mechanical college for whites, while the Hampton Normal and Agricultural Institute (*q.v.*), at Hampton, receives certain aid for offering similar instruction for the negro race. The Virginia Military Institute (*q.v.*), at Lexington, founded on the model of West Point, is a state military college. All of these, except Hampton, are for men only. In addition to these, ten colleges under denominational or nonsectarian control assist the state institutions in offering collegiate instruction for whites only, six of which are coeducational. Among these are a number of old foundations. Seven additional colleges for women only, all but one dating from or before 1860, exist. Four institutions offer college instruction for the negro race.

Among special institutions, the state maintains the Laurel Industrial School, for whites, at Laurel; the Negro Reformatory Association of Virginia Reform School, at Hanover; the Virginia State School for the (white) Deaf and Blind, at Staunton; and the Virginia State School for Colored Deaf and Blind Children, at Newport News. E. P. C.

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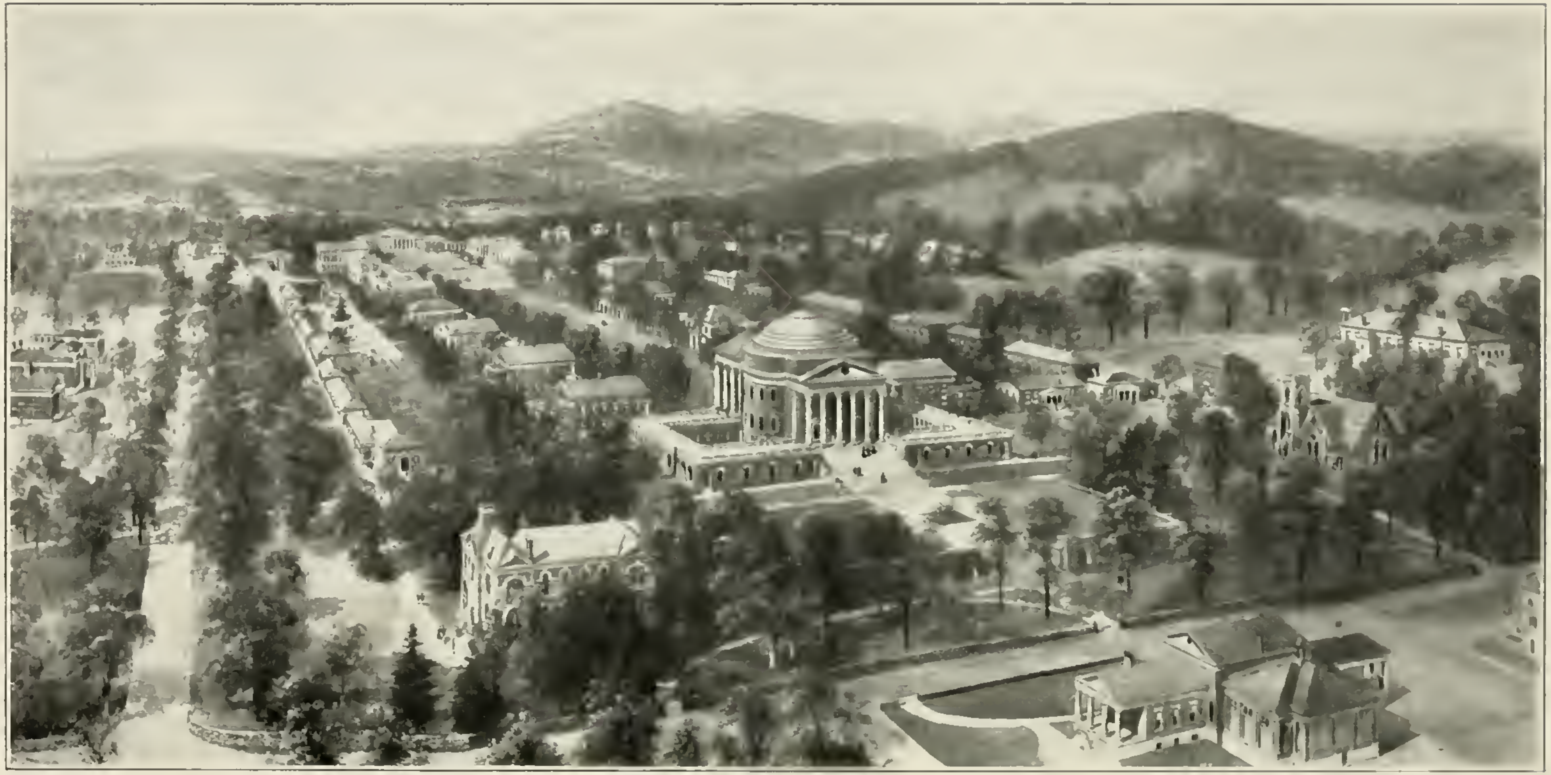
VIRGINIA, UNIVERSITY OF. — **Historical Sketch.** — In 1803, the legislature of Virginia incorporated Albemarle Academy, which, however, was destined never to exist except on paper. But under the guidance of Thomas Jefferson, who was elected to the board of trustees on March 23, 1814, a process of development was begun leading first to the organization of Central College, and afterwards to that of the University of Virginia.

In 1816, the legislature authorized the establishment of Central College, Charlottesville, at the place which had been selected as the seat of the academy. The board of visitors of the college consisted of six members, of whom Jefferson was the only one who had been a member of the academy board. The other five members were James Madison, James Monroe, Joseph Carrington Cabell, David



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University of Virginia.

Watson, and John H. Cocke. On May 5, 1817, Jefferson was elected Rector of the board, and, on the same day, the board authorized the purchase of a farm of about two hundred acres lying one mile west of Charlottesville as a site for the college. This tract now forms a part of the grounds of the University of Virginia. The cornerstone of Central College was laid on Oct. 6, 1817, in the presence of Thomas Jefferson, Rector, and of James Madison and James Monroe — the latter then President of the United States. This building is located on what is known as the west lawn of the University. The prime object in Jefferson's mind, while Rector of the board of visitors of Central College, was to get the college well under way, and then have it adopted by the legislature as the State University. Accordingly, in the first report of the visitors to the legislature, of date Jan. 6, 1818, it is recommended that a state university be established on the site of Central College. As a result of the persistent efforts of Jefferson and his friends, on Jan. 25, 1819, the legislature adopted a formal act "for establishing an university," and this date must be reckoned as the year of the origin of the University, although the institution was not opened to students until March 7, 1825.

The first board of visitors consisted of four members of the old board of Central College — namely, Thomas Jefferson, James Madison, Joseph Carrington Cabell, and John H. Cocke; the additional appointees were James Breckenridge, Chapman Johnson, and Robert B. Taylor. The board met for the first time on March 29, 1819, and elected Thomas Jefferson Rector. Henceforth, until his death in 1826, Jefferson was the dominating and directing power of the University, not only evolving the entire system of education introduced, but actually devising, to the minutest detail, every feature of construction and administration.

Government and Organization. — The organization of the University, its government, discipline, and methods of instruction, were virtually prescribed by Jefferson alone; and in many respects they still retain the impression derived from him. By virtue of its charter, the supreme government of the institution, under the General Assembly, is vested in the Rector and Visitors. Under the general direction of this board, and subject to its regulations, the affairs of the university were administered, for the first eighty years of its existence, by the faculty and its chairman, the latter being a member of the faculty, who occupied temporarily the position of chief executive officer of the institution. As the University grew, it became more and more difficult for a member of the teaching staff to fill the position of chairman and attend to the manifold executive duties attached to that office. In October, 1903, the visitors decided that modern conditions rendered necessary the creation of the office of president; and in June, 1904, Edwin Anderson Alderman was elected first president of the University of Virginia.

The scheme of instruction organized by Jefferson contemplated no fixed uniform curriculum of studies to be pursued by every student alike, without discrimination. Each distinct branch of knowledge was, as far as was practicable, assigned to an individual "school" with its own instructors; and the University was to consist of a collection of independent schools. The origin of the elective system at the University of Virginia is found in the fact that students were permitted to matriculate in any school or schools of the University for which they were prepared. The original organization consisted of eight independent schools — namely, ancient languages, modern languages, mathematics, natural philosophy, moral philosophy, chemistry, medicine, and law. The first seven schools mentioned were opened in 1825, with an aggregate attendance, during the first session, of 123 students. The school of law was not opened until 1826.

This original organization was, of course, gradually enlarged and modified. As early as 1837 the school of medicine was elevated to a department, consisting of three individual schools; while in 1850 the school of law was enlarged to a department consisting of two schools.

As at present organized, the University comprises thirty distinct and independent schools, with a teaching staff (not including the teaching staff of the summer school) of over one hundred members. The courses of instruction given in these are so coördinated as to form six departments, two of which are academic, and four professional (or technical); viz.: —

The Academic Departments. — The college, with the degrees of Bachelor of Arts; Cultural Bachelor of Science; Vocational Bachelor of Science. The department of graduate studies, with the degrees of Graduate in a School; Master of Arts; Master of Science; Doctor of Philosophy.

The Professional Departments. — The department of law, with the degree of Bachelor of Laws. The department of medicine, with the degree of Doctor of Medicine. The department of engineering, with the degrees of Civil Engineer; Mechanical Engineer; Electrical Engineer; Mining Engineer; Chemical Engineer. The department of agriculture, with the degree of Bachelor of Science.

The enrollment of students during 1911-1912 was 818. The summer school of the University of Virginia, with a faculty of some sixty-five members, had a student enrollment of 1350 during the summer session of 1911. The libraries contain more than 70,000 volumes. The university owns equipment, buildings, and grounds of an estimated value of $2,019,530; holds productive funds to amount of $1,394,526.22, and receives an annual appropriation from the state of Virginia of $98,000. The annual expenditures for the session of 1910–1911 were $243,374.62. J. M. P.

See French Influence in American Education; Jefferson, Thomas.

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VISIBLE SPEECH. — See Deaf, Education of the.

VISION. — See Eye.

VISITATION ARTICLES AND EDUCATION. — The visitations constituted the means by which the bishops and official clergy of the established churches carried out their oversight concerning education and religious conditions in general. The *Visitation Articles* and *Injunctions*, issued by the bishops before the Reformation, by bishops, monarchs, and synods after the Reformation, contain in very numerous instances the concrete materials concerning educational conditions both before and after the Reformation. For England a large selection of these has recently been made available in the Alcuin Club Publications, Vols. XIV, XV, and XVI (London, 1910) in *Visitation Articles and Injunctions of the Period of the Reformation*, edited by W. H. Frere, D.D. For the German documents, see the article on Kirchenordnungen. In general consult the articles on Reformation and Education; Bishops' Schools; Church Schools, etc.

VISITATION NUNS, VISITANDINES. — See Teaching Orders of the Catholic Church.

VISITORS IN SCHOOLS. — The practice in American public schools is to welcome teachers and parents as visitors. Usually no special permit is required, save in schools for subnormal or delinquent children, where more complete control is necessary and usual. By tradition, permission is usually requested at the principal's office (or of the teacher) and is always granted save under exceptional or special occasions, such as the presence of a substitute teacher, lessons on personal hygiene, etc. The formal visitation of the school by large groups of school officials and citizens characteristic of previous centuries has practically disappeared. Professional school inspection by expert supervisors has been substituted for the older and less efficient formality of visiting day; and coöperation between the community and the school is now better obtained through teachers' and parents' associations and the distributed school visits of the parents. H. S.

VISUAL AIDS. — The last century of schoolroom practice has been marked by a great increase in the use of natural objects, models, pictures, maps, charts, and other visual aids. The introduction of the natural sciences has necessitated the use of actual materials or of their representations, and these methods have been gradually transferred to the older subjects as their worth has been demonstrated. At the same time the psychological inquiry into the nature of the teaching process has given their use an additional sanction and stimulus. As a product of science teaching and improved pedagogy, visual aids have (1) gained a wider use, (2) included a wider range of types of materials, and (3) passed from exclusive use in the demonstrations of the teacher to personal use by the children themselves. This tendency toward the increased use of visual aids can be readily measured by examining any single line of development, — the enlarging use of objective teaching, the increase of laboratory instruction, the growing expenditure for classroom equipment, or the greater frequency of pictures and diagrams in school textbooks.

Visual aids are exceedingly varied in form, but they may be classified into distinct types on the basis of their relation to the objects they stand for or on their psychological function in the learning process. Four types of visual aids are thus readily distinguishable: (1) natural or artificial objects which are actual, not representative (lentils, sticks, tablets, mechanical instruments, chemicals, plants, shrubs, insects, etc.). These give the child a total impression from which he must eliminate accidental qualities and extract fundamental characteristics. (2) Pictorial substitutes, which are grossly representative of the actual objects (photographs, lantern projections, drawings, etc.). These give a practical and static impression of the realities for which they stand, but with which the child must still work with a discriminating and selective attention. (3) Schematic representations which represent only the essential qualities of the actual objects for which they stand (maps, globes, reliefs, scientific drawings, plans, diagrams, mathematical models). Such schematic representations are of two types: (*a*) plane figures depending on line, space, and color (maps and mechanical drawings), and (*b*) three-dimensional models depending on form and form relations (reliefs, globes, models). Here the child perceives at once the elements necessary to his thinking. The situation is in a sense resolved for him. (4) Symbolic substitutes, which are not like the objects for which they stand, but are symbolic of them, (graphs, diagrams, curves, algorisms, topical outlines, cartograms, stereograms, etc.). Here the appearance is not perceptually like the real situation which it indicates, but is symbolic of it. To interpret these symbolic aids the child must have some habitual knowledge of the symbolism employed. The symbolism is requisite because the thing visualized is a relation or abstraction incapable of pictorial or schematic representation. It is usually a relation or some other abstraction which is given visual form (algorisms and topical outlines).

There are various devices in common use which are not accurately indicated by such a convenient classification. They require some special mention, either because they are intermediary types or classes (*e.g.* some mathematical models and geographical maps), or represent flexible means that may give visual aid in more than one typical way. Models may imitate the real objects with great fidelity (anatomical models), or they may be mere schematic (almost symbolic) representations (mathematical models). Lantern slides and charts may be the means of representing photographs, mechanical drawings, and symbolized relations. Again, while most visual aids give a static objectification, some are primarily intended to represent movement or relations of sequence (moving pictures, laboratory apparatus).

In the broadest sense a visual aid is any device utilized to objectify and thus to clarify the impressions or thought of the learner. Hence, a school excursion (*q.v.*), where the class goes to the object, instead of the object being brought to the class, is, broadly but accurately speaking, a visual aid. Current usage gives a less inclusive meaning to the term, — objects at the one extreme and algorisms and topical outlines at the other being excluded. It would be better if the entire subject were discussed more broadly than in visual terms, so as to include all sense aids of importance in classroom instruction. A discussion of sense aids would then include self-playing pianos in teaching appreciation of music, and all other devices intended to give clear sense impressions of any type. The great practical predominance of visual aids accounts for the exclusion of other types in ordinary discussion.

The value of visual aids is large. The professional teacher of to-day scarcely makes an adequate use of his resources in this direction. The practice is too much restricted to actual objectification and not enough to the other representations. Pictures, while not as greatly neglected as graphs, might be used more widely. Visual aid materials offer a versatile series of objective devices that prove contemporaneous visualizations too restricted and monotonous. School supervisors and boards of education are largely responsible for not providing adequate funds for equipment. But even the visual aids at hand are misused. A careless pedagogy sometimes lays emphasis on highly artificial materials when actual things ought to be used instead. The use of rings, lentils, and sticks in primary arithmetic, of pictures and classifications rather than real plants and animals in nature study, and maps instead of real mountains, valleys and streams in beginning geography, — are cases in point. Again a false application of the doctrine of interest impels the teacher to drag in pictures for their own sake when the interest they invoke distracts from rather than contributes to the problem at hand. The distribution of visual aids is often not well calculated in terms of psychological need. In some cases the time of young children is wasted with overuse of visual aids, and older children are not taught with their help when there is real need. The need of visual aids is always relative to the pupil's experience with and knowledge of the difficulty in mind, regardless of the number of years he has lived in general. Objectification is necessary wherever there is special immaturity with regard to a given aspect of experience (cube root in the eighth school year), or where the relations of thought are so complex that many of the factors ought to be given a simplified visual objectification so that thinking may proceed with these elements recorded before the eye for easy reference (graphs in high school mathematics). H. S.

Visual Aids to Teaching Mathematics. — There developed in the early years of the twentieth century a great deal of interest in the question of the rôle of intuition, experiment, and visualization in mathematics. The lead was taken quite as much by Austria as by any other single country, with Germany about equally prominent, and with certain parts of Switzerland well to the front. The movement centered largely, in the early school years, in mensuration. It has been found that children of the fifth grade appreciate field measurements involving such simple apparatus as an angle measure (even a radius on a paper protractor), and that they draw figures to scale and compute heights and distances from the drawing. Even before this grade, visual aids are used in the teaching of counting, fractions, and the simple mensuration of rectangles; but from this time on it is possible to introduce systematically and successfully aids of a more scientific character. Among those that appeal to children in the elementary school may be mentioned the following: the mirror, for measuring heights; the mirror angle, for running perpendiculars, useful in computing distances; the prism, used for the same purpose; the hypsometer, a simple instrument that can be made from heavy pasteboard and used for measuring heights; the clinometer, easily made from a paper protractor and used in measuring slopes; the pocket compass, or some elaboration of it that permits of measuring horizontal angles; the protractor with a moving radius, easily made from paper; graduated staffs, used in measuring altitudes by means of simple ratios, and similar aids that can be used in visualizing mathematics in the field or schoolroom. In the mensuration of solids it is possible to purchase sets of models, the German ones being superior in workmanship to any others. German makers also have for sale models of the solids used in geometry, from the elementary to the most advanced.

In general it may be said that there is quite as much danger in the too extensive use of models and instruments as in their total neglect. In the elementary school they add to the interest by their novelty, and to the powers of visualizing similar forms. In the secondary school they are capable of abuse by being used so extensively that the pupil depends upon them too much and fails to acquire the power of mentally seeing the solids that he is studying. A moderate use of simple instruments (home made, if necessary) for the purpose of mensuration is of unquestionable value. Similarly, the making of certain models in solid geometry is of value, and their moderate use is justified, but to have a model, or even a picture of one, for every proposition makes for weakness rather than strength. The general principle, in elementary as well as higher mathematics, is to use visual aids only so long as they are necessary to fix a mental picture, thereafter referring to them only when this picture becomes so dimmed as to make them again necessary. D. E. S.

Visual Aids to Teaching Latin and Greek. — The various schoolbooks, including beginners' books and editions, are now, as a rule, profusely illustrated with maps, diagrams, reproductions of ancient sculpture and coinage and, in the case of Cæsar, with photographs of the present appearance of the ancient battle fields.

Besides the textbooks, however, there are many other publications for the use of students and for classroom illustration. Of prime importance are large maps, the best of which are those of Kiepert (Reimer, Berlin). There are numerous school atlases in all countries.

A capital book is Hill's *Illustrations of School Classics* (London, 1903), which gives numerous illustrations covering the fields of religion and mythology, history, and antiquities, with a special chapter on buildings. This may be well supplemented by Schreiber's *Atlas of Classical Antiquities* (Macmillan, 1895).

Lantern slides have been prepared in great numbers by G. R. Swain, Lockport, Ill. to illustrate Cæsar's life and campaigns (400 slides) and Greek and Roman archæology in general. The Records of the Past Exploration Society (Washington, D.C.) has issued forty slides illustrating Vergil's Æneid as well as sets illustrating Pompeii (50 slides), Homer (65 slides), and Greek and Roman mythology (50 slides). These are expensive, but very fine. Excellent and cheap half-tone prints of classical architecture and sculpture are issued by the Bureau of University Travel, Boston, Mass., the Perry Pictures Co., Malden, Mass., A. W. Cooley, Auburndale, Mass. Washington University, St. Louis, will furnish slides based on the remains and reconstruction of the Saalburg Camp.

For the Gallic War we have also Oehler's *Bilder-Atlas zu Cæsars Bücher de bello Gallico* (Leipzig, 1890), and Von Kampen's *Quindecim ad Cæsaris de bello Gallico commentarios tabulæ* (Gotha). L. Gurlitt has also published six *Anschauungstafeln zu Cæsars bellum Gallicum* (Gotha).

W. B. Harrison of New York has issued a very extensive and cheap collection of *Illustrations for History Notebooks*, in which there are outline maps as well as reproductions of every conceivable ancient object. These can be made very serviceable.

Visual aids have a prominent place in the direct method. For this purpose Dent and Co. (London) have issued a number of colored *Wall Pictures of Roman Antiquities.* These may be supplemented by Launitz's *Wandtafeln zur Veranschaulichung antiken Lebens.* (Cassel.) Cybulski's colored *Tabulæ quibus antiquitates Græcæ et Romanæ illustrantur* (Leipzig, Koehler) are also invaluable for such use. Bell and Co. (London) have recently issued a series of sixteen colored picture cards, with vocabularies and exercises covering a similar ground. The pictures in Gurlitt's *Lateinische Fibel* and *Lesebuch* (Berlin) could easily be reproduced, and would give much variety to the material.

Especial reference should be made to Hensell's *Modelle zur Veranschaulichung antiken Lebens* (Diesterweg, Frankfurt a. M.). These models have to do with ancient clothing, and life, and with military engines. They could easily be reproduced by the manual training department of any school. They are not expensive when the size and demand for such models is considered. G. L.

Visual Aids to the Teaching of History. — An excellent description of special aids to the visualization of history, embracing the United States and the principal countries of Europe, was published in the *History Teacher's Magazine* of February, 1910, and can now be obtained in pamphlet form from the McKinley Publishing Co., Philadelphia, for fifteen cents. There is also available a classified catalogue of similar scope prepared by a committee of the New England History Teachers' Association, and published by Houghton, Mifflin and Co., at fifty cents. Both of these contain price lists and names of makers, publishers, and dealers. The extensive German material is more fully listed, with prices but without names of makers or publishers, in the *Verzeichnis der bewährtesten Lehr-u. Auschauungsmittel für höhere, mittlere und Elementarschulen* issued from time to time in Leipzig by K. F. Koehler. Copies of this can usually be purchased for fifty cents. It should be noted, however, that Koehler accepts orders for material only when sent through regular dealers. Special circulars descriptive of the remarkable Rausch models are sent gratis on application to Friedrich Rausch, Nordhausen a. Harz, Germany. The aids of special practical interest to American teachers of history, and the question of how to use them form the subject of several chapters in Johnson's *Teaching of History in Elementary and Secondary Schools.* See also *Anschaulicher Geschichtesunterricht* by Edgar Weymich.

See OBJECT TEACHING. H. J.

VISUAL PERCEPTION. — The psychological treatment of the general topic of perception (*q.v.*) has emphasized vision more than any other sense. This is due first to the fact that the phenomena of vision are easily investigated, and second to the fact that vision plays a more important part in human experience than any other sense unless it be the sense of hearing. The importance of vision as a subject of scientific investigation is illustrated in the discussion of space (*q.v.*). Especially the facts of binocular vision (see STEREOSCOPE; FUSION) lend themselves readily to experimental analysis. The highly developed organ of sense which appears in the retina has been the subject of exhaustive research (see COLOR; COLOR-BLINDNESS; etc.). Since the appearance of Berkeley's epoch-making work, *An Essay toward a New Theory of Vision,* and Wundt's experimental treatise, *Beiträge zur Theorie der Sinneswahrnehmung,* visual perception has engaged a significant share of the energy of students of mental life.

On the practical side the importance of vision is obvious to even the casual student of human life. The animals depend in large measure on smell and taste and touch to guide them in their contact with the external world. In human life the three senses mentioned sink into insignificance as compared with vision. The superiority of vision arises in part out of the fact that it is a distance sense, that is, it brings to the individual sensory impressions from remote objects, and thus facilitates deliberate reactions which can be formulated during the approach of the object. Further, the highly differentiated character of vision makes it possible to distinguish qualitative shades of sensation which permit the most minute adjustments of reaction. Hearing is a social sense and permits the developing human being to come into relations with his fellows. But hearing is not a suitable sense with which to explore the physical world, because bodies are not for the most part emitting sounds at a time when human attention should be concentrated upon them. All bodies are constantly reflecting light, and hence the importance of vision as a sense is greater than that of hearing.

Finally, for the purpose of education vision is at least equally important with hearing; hence the study of the processes of visual perception is an important chapter in educational psychology. C. H. J.

VISUALIZATION. — See EYE AND EAR MINDEDNESS.

VITAL STATISTICS. — See MORBIDITY IN SCHOOL CHILDREN; MORTALITY, RATE OF, AMONG SCHOOL CHILDREN.

VITTORINO DA FELTRE (1378–1446). — Humanist scholar and teacher born at Feltre. Little is known of his boyhood, but at the age of eighteen he entered the University of Padua and pursued the arts course. To enable him to attend lectures in dialectic, rhetoric, and philosophy he became a private tutor. He remained at Padua for twenty years and taught grammar and mathematics, a subject in which he had attained considerable reputation. For a time he was a *famulus* in the house of Barzizza (*q.v.*) and became one of the most finished Latin stylists of his day. After leaving Padua he joined Guarino (*q.v.*), who had a school at Venice, and at the same time seems to have studied Greek. In 1420 he returned again to Padua, and received a number of young students into his house, not more than he could personally supervise. In 1422 he was appointed professor of rhetoric in succession to Barzizza, but resigned at the end of the year, indignant, it is said, at the lack of discipline and moral purpose among the students. He returned to Venice, and there opened a school, but within a few months he was invited by Ganfrancesco Gonzaga to Mantua as tutor to his children. Insisting on an arrangement which would safeguard his independence and authority, Vittorino accepted the position. At Mantua he was assigned the use of a palace known as *La Gioiosa,* the House of Pleasure, changed by Vittorino to *La Giocosa,* Pleasant House. At first he began with three children of the Gonzaga family; within a year he added to these the children of his own friends, the children of noble and wealthy families, and a number of poor pupils, whose fees he remitted and whom he even furnished with clothing. But all alike were expected to manifest a serious purpose and industry. The pupils varied in age from six to seven to over twenty, the older pupils sometimes being employed as assistants. Among his pupils was Cecilia, the daughter of Gonzaga, and Vittorino's attitude in the education of women may be inferred from the fact that she enjoyed the same studies as her brother. Vittorino was influenced in his attitude to education, like most humanists, by Plutarch's περὶ παίδων ἀγωγῆς, by Quintilian, and probably by Vergerius' treatise. With the humanist ideal of the scholar he combined the ideal of the Christian gentleman. His whole purpose was to reconcile the Christian ideal with the literature of the classics. The curriculum of the Mantuan school was broad and liberal. While retaining the old terms, the *trivium* and *quadrivium*, the medieval methods were discarded and the subjects were vitalized and infused with human interest. The pupils read widely in Latin and Greek, were trained in grammar, composition, and the literature, history, and thought of the Old World, and studied arithmetic, geometry (including drawing, mensuration, and surveying), astronomy, natural history, and music. Vittorino gave much thought to collecting a library. There was an alternation of studies with studies or with games and exercises. Corporal punishment was, so far as possible, eliminated. No other teacher had ever paid so much attention to the health of his pupils as did Vittorino. Games and exercises played an important part in the school, but the end was not athletic skill so much as hardiness and good health. To all this were added such religious instruction and guidance as could come only from a man of deep religious convictions himself.

Vittorino numbered some of the most distinguished humanist scholars among his pupils, including L. Valla, Perotti, Ognibene de Lonigo, and John, Bishop of Aleria. Among his teachers were Theodore Gaza and George Trapezuntius (of Trebizond), while among his patrons were Poggio, Filelfo, and Guarino. Vittorino's skill had attracted the attention of all his contemporaries, and his loss was felt not only by his pupils, and by the citizens of Mantua, for whom he had hoped in accepting service with Gonzaga to train up magnanimous rulers and princes, but also by scholars throughout the country. And if no written works of his remain to attest to his eminence as a scholar, such accounts as can be pieced together tend to show how great was his service to educational practice. Through Vittorino, the first modern schoolmaster, the ideal of the scholar and the gentleman found its way into educational thought.

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WOODWARD, W. H. *Vittorino da Feltre.* (Cambridge, 1905.)

VIVES, JUAN LUIS (1492-1540). — Humanist educator, who with Erasmus (*q.v.*) and Budaeus (*q.v.*) made up what was termed the Triumvirate of Letters of the time. Of these three the most systematic and thoroughgoing educationist was Vives. He was born of a noble family at Valencia, in Spain, March 6, 1492. Vives marks the transition from medievalism to the Renaissance, for as a youth at school, at fourteen or fifteen years of age, he supported scholasticism along with his teacher Amiguetus. From Valencia he went to the University of Paris in 1509, and in 1514 he proceeded to Bruges, then the great resort of Spaniards in the north of Europe; from that time onward, Vives' main quarters were at Bruges, or Louvain, though he lived the life of the traveling scholar of the time.

In 1519 Vives, in his *In Pseudo-dialecticos*, broke finally with the old scholasticism and the Parisian schools by his fierce protest against medieval disputational dialectic, and in place of it, his advocacy of the study of the new Renaissance materials of knowledge and inductive methods of inquiry. As an advocate of the inductive method of the observation of nature, Vives ranks as a pioneer of Francis Bacon. In 1523 Queen Catharine asked him to write a plan of studies for her daughter Mary; and for the son of Mountjoy, the pupil and patron of Erasmus, Vives also wrote a boy's plan of studies. The University of Oxford incorporated him to the Doctor of Laws degree, and he was made a University Lecturer with a salary of £20 and rooms in Corpus Christi College, Oxford. The whole course of his Oxford life is carefully retraced by P. S. Allen (*Ludovicus Vives at Corpus, Pelican Record*, Oxford, Dec., 1902). From 1523 to 1528 Vives divided his life between England (viz. Oxford and London) and Bruges. In the trouble of Queen Catharine's divorce, Vives remained faithful to the losing cause of the Queen, and suffered detainment for six weeks, was dismissed from the Court, and lost his pensions from both the King and the Queen. From 1528, when he left England, to 1531, he suffered the distress of poverty, though he persevered in his studies and book-writing.

In his own generation, Vives was acclaimed as "the second Quintilian," and his position amongst scholars may be judged by the recorded testimony of More and Erasmus, with the addition of the suggestion in one of Erasmus' letters, that he recognized that he might, though an older scholar, find himself eclipsed by Vives. On matters of church reform, Erasmus and Vives fought for the same causes, though Erasmus drew the attention of all men, friends and foes, by the brilliancy of his satire. Vives, with transparent sincerity and directness, indulged in the directest of pleas for what he wanted. He wrote direct letters upbraiding King and Emperor for foolish wars, and demanding that Christian monarchs should follow peace, and give up all war, except on the enemies of Christ. This is his aim in the *De Europæ Dissidiis et Bello Turico*, 1526, and in the *De Concordia et Discordia in humano Genere* in 1529. Nor did Vives fail to give Henry VIII "faithful" advice in the matter of the divorce, after he had left England, whereas Erasmus was perfectly willing to let the matter drift against the Queen. On the positive side, and in accordance with modern social views, no writing of Erasmus is so striking in connection with the treatment of the poor as the almost unnoticed work of Vives, entitled, *De Subventione Pauperum*, in 1526. The fact is that the name of Vives has been obscured in later ages. He never left the Church of Rome, though that Church placed his *Commentaries on St. Augustine* on the *Index*, on account of what we should call "rational" and broad-minded views. And Protestant writers preferred to quote the names of Vives' contemporaries, as well as successors, who had not shown so much respect for the Roman Catholic Church.

On the educational side Lange has traced the permeating influence of Vives as of startling significance in later pedagogy. (See Schmid, *Encyklopädie des gesammten Erziehungs- und Unterrichtswesen*, Vol. IX, pp. 843–851.)

The chief educational works of Vives were: (1) *Plans of Education* for Princess Mary and for Charles Mountjoy (1523); (2) *De Institutione Feminæ Christianæ* (1523); (3) *Introductio ad Sapientiam* (1524); (4) *De Causis Corruptarum Artium* (seven books), and *De Tradendis Disciplinis* (five books, 1531); (5) *Linguæ Latinæ Exercitatio*, or School Dialogues (1539).

The Institution of a Christian Woman (No. 2 above, translation by Richard Hyrde, 1540) shows Vives' views as the pioneer of woman's education on Renaissance principles. He retains the pietistic basis, rejects the reading of medieval romances, approves manual training, introduces humanistic Latin, and presents an ideal of domestic education. *The Introduction to Wisdom* (Sir R. Morison's Translation, 1540 of No. 3 above) consists of precepts or maxims by which the student should order his life intellectually and morally. The *De Disciplinis*, Vives' greatest educational work, consists of the seven books on the causes of the corruptions of learning, especially during the Middle Ages, and the five books of constructive work on the transmission of knowledge, probably the greatest educational work of the Renaissance.

Finally, it should be noted that Vives wrote the *De Anima* (in 1539), a work which establishes him as the father of modern psychology.

F. W.

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VIVIDNESS. — An attribute of mental processes directly related to attention. That mental process is vivid upon which a high degree of attention is concentrated. Vividness is to be contrasted with intensity. A very faint whisper for which one is anxiously waiting may be vivid in the highest degree, although the sound sensation is very weak. On the other hand, the roar of machinery in a factory may be neglected while one listens to a conversation or looks at his work. The loud roar in this case is not vivid, though the sound sensation is intense. Vividness is to be contrasted with clearness; the latter characteristic appears in those mental processes which stand in definite and explicitly recognized relations to other mental processes. Thus, the demonstration of a geometrical proposition may consist of a series of steps which are clear, but the impression made by the exercise may not be so vivid as a strong emotional experience which is not definitely thought out. In spite of the contrasts above pointed out, the general rule may be laid down that other things being equal intensity and clearness contribute to vividness. Vividness may, however, as in the examples cited, arise wherever attention is at a high level even when intensity and clearness are at a low level.

Vividness has been explained by Münsterberg as dependent on the readiness with which one reacts. That stimulus which finds motor channels open will be vivid; that stimulus which finds motor channels closed will not be vivid, no matter how intense it is. This is a very productive suggestion for the teacher. Whatever experiences are to be vivid should be related in some way to action.

C. H. J.

See Attention; Clearness; Psychophysics.

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VOCABULARIES. — See Latin Language and Literature in Education, under Latin Grammars, Vocabularies, and Teaching Apparatus

VOCAL MUSIC. — See Music.

VOCAL ORGANS. — The vocal organs include the lungs, tongue, lips, mouth, as well as the throat, but in a more especial manner the organs of the throat are designated as the vocal organs. The breath passes from the lungs through the windpipe into the larynx. Across the larynx are stretched two elastic ligaments called the vocal chords. At one end they are fastened in front of the larynx and at the other they are fixed to two movable cartilaginous bodies, the arytenoids. The space between the chords, called the glottis, can thus be narrowed or closed. The glottis consists of two parts, the chord glottis and cartilage glottis, and these can be opened or closed independently. The chord can be lengthened or shortened by muscular contraction. Above the true glottis, forming a part of the larynx, appears the upper or false glottis, by which the passage can be narrowed or partially closed. The epiglottis is a valve at the top of the larynx which in swallowing and in forming certain sounds is pressed down so as to cover the opening of the larynx. The cavity between larynx and mouth is the pharynx. The roof of the mouth consists of the soft and hard palate, the lower hanging extremity of the soft palate being the uvula. E. H. C.

VOCATION SCHOOLS. — See INDUSTRIAL EDUCATION; MANUAL TRAINING; VOCATIONAL GUIDANCE.

VOCATIONAL EDUCATION. — In a certain sense, all education is vocational in that it aims to prepare one for the more efficient and satisfactory performance of the activities of life. Even liberal education is in a sense vocational, for in its various forms it has aimed to prepare for the life or calling or " vocation " of a statesman or man of public affairs, of the gentleman, of an ecclesiastic, or whatever the particular social concept of the liberally educated man may have taken. Even in the classical period, when the conception of liberal education was formed, it aimed to produce the liberally educated man, the philosopher in Greece, the orator in Rome, respectively defined as the educated man or the man efficient in the application of his knowledge. In its earlier historic stages elementary education was always vocational, in that it was merely a preparatory stage to some form of higher education, whether the vocation to be followed was that of a scholar, an ecclesiastic, or a gentleman.

But in the ordinary usage of the term, vocational education is differentiated from the more general stages of education, in that the chief concern of education in its vocational form is the training in the practical application of knowledge acquired in early stages of the educational process and the education of selected or differentiated groups. In this sense, vocational education includes all the various forms of higher or professional education and is treated under a variety of captions. Thus, education for the law, medicine, the Christian ministry (see THEOLOGICAL EDUCATION), and for the various phases of engineering (see TECHNICAL EDUCATION) are forms of vocational education discussed under these titles. So also AGRICULTURAL EDUCATION; COMMERCIAL EDUCATION; TEACHERS, TRAINING OF, and allied subjects all represent phases of vocational education, though frequently distinguished, as professional education, from those vocations where the manual element is more prominent, and the intellectual or scientific is of a more elementary character. This last phase, the one generally indicated as vocational education, is treated under the caption INDUSTRIAL EDUCATION. The recent organization of vocational education for women is discussed as one phase of HOUSEHOLD ARTS, EDUCATION IN. See also in this connection the articles on SECRETARIAL PROFESSION, EDUCATION FOR THE; NURSING, EDUCATION FOR.

The vocational aspect of education is becoming a topic of very general importance, and is discussed in its theoretical aspects, in addition to the above topics, in the articles on EDUCATION; ART IN EDUCATION; CITIZENSHIP AND EDUCATION.

For the general literature of the subject, see the reference lists appended to all the above topics.

VOCATIONAL GUIDANCE. — A recent development in education and philanthropy which aims to give to parents and children information with regard to trades and industries and other occupations, and the best method of entering or preparing to enter them. It is not an attempt to find employment for young people, although this is sometimes done, but rather an effort to secure intelligent selection of a pursuit on the basis of adequate knowledge. With this movement is combined a desire to promote better preparation for life career and the avoidance of blind alley occupations and consequent aimless drifting. While a certain amount of vocational guidance and direction has for a long time been given in connection with lads' clubs and social centers, the movement as it is now known hardly goes farther back than 1907. A bureau for advising young men in the choice of a vocation was opened in that year by Professor Frank Parsons at the Civil Service House in Boston. In 1909 a Vocational Bureau was organized at the Civil Service House and a director was appointed to obtain information on different occupations, to collect industrial statistics, and to discover the educational opportunities. The Bureau secured the interest of business men, educators, and social workers, and the Boston School Committee appointed a Committee on Vocational Guidance to coöperate with the Vocational Bureau. The Committee centered its aim in promoting among the school children, parents, and teachers an appreciation of the value of the life career motive. Vocational lectures were given to the graduating classes of the elementary schools; vocational counselors were appointed in practically all the schools, high and elementary, of the city; care was taken in placing pupils in remunerative employment, in advising and following them up. Vocational record cards were kept of elementary school graduates and high school pupils. Information was furnished on the different occupations, the wages, permanence of employment, the chances of promotion, etc. The work on the whole is valuable not only for the pupils but also for the teacher, whose outlook is broadened, and for the employer, whose coöperation is obtained and who, if he offers satisfactory conditions of employment, is supplied with efficient help. Thus the vocational bureau or committee or counselor forms a valuable link between the home or school, and the shop or industry. The chief end to be attained is to arouse an interest in parents and children in the opportunities which are best in the long run, and to keep the young worker from entering the blind alley occupations where the initial wages may perhaps be a greater inducement. Where such advice is in place, the value of an adequate preparatory training is emphasized.

The Vocational Bureau has published a number of bulletins, including *The Machinist*, *Banking*, *The Baker*, *Confectionery Manufacture*, *The Architect*, *The Landscape Architect*, *The Grocer*, *Bookkeeping and Accounting*, *Department Stores*, each of which gives an account of the trade or industry, its divisions, dangers, conditions, and future; pay, positions, and opportunities; apprenticeship and qualifications; and comments. The Bureau, recognizing the need of special training, gives a course for vocational counselors, and in 1911 conducted a school of arts and sciences in connection with the Harvard University summer school.

Besides the Vocational Bureau and the Committee on Vocational Guidance, three other organizations in their own way coöperate to the same end: the Boston Home and School Association, the Girls' Trade Association, and the Women's Municipal League. Of these the first arranges, among other activities, lectures and conferences on vocations at parents' associations; the second, among other activities, has given attention to the vocational opportunities for girls between fourteen and eighteen, and on the basis of the information offers guidance to them. This association has also published a number of bulletins, *e.g.* *Telephone Operating*, *Bookbinding*, *Stenography and Typewriting*, *Nursery Maid*, *Millinery*, etc., setting forth the nature and conditions of the work, the training required and how obtained, positions and pay, etc. The Women's Municipal League of Boston approached the matter from a different standpoint, appointing a committee to inquire into the opportunities for vocational training, and on the basis of this study gives advice to children, parents, teachers, and others, thus seeking to prevent overlapping and waste of money and effort.

In New York the High School Teachers' Association undertook in 1908, through a teacher or a committee of teachers in each school, to help students to choose a career. Through a general committee the Association collects information on the qualifications necessary for entering any occupation, the remuneration, the permanency of employment, etc., and publishes leaflets, *e.g.* *Choosing a Career* (one for boys and one for girls), *Openings for Boys in Machine Shops*, etc. In 1910 an appropriation of $250 a year was granted from public funds for the expenses connected with the work. Vocational guidance is also being undertaken by individual teachers in the elementary schools of Brooklyn and New York, and the question is being considered by a joint committee of the Junior League and the Public Education Association of New York. The rapid spread of the movement is well illustrated by the fact that at the national conference on vocational guidance held in Boston on Nov. 15 and 16, 1910, delegates were present from thirty-five cities, including New York, Boston, Chicago, Cleveland, Pittsburg, Philadelphia, St. Louis, etc.

In Great Britain the movement in favor of vocational guidance is also spreading. Within a smaller compass this work has been conducted for many years by the Apprenticeship and Skilled Employment Committees, *e.g.* at Cambridge, Hampstead, and other divisions of London. These committees, through a central association, have published handbooks for boys and girls: *Trades for London Boys and how to enter them*, and *Trades for London Girls and how to enter them*. A further influence radiating from this special work has been exercised on vocational training and attendance at continuation schools. Many education committees, through their childrens' care and other committees, have given attention to the question of vocational guidance and the securing of suitable employment for children. More recently, since the passing of the Labor Exchange Act, 1909, and the Education (Choice of Employment) Act, 1910, educational authorities are empowered "to make arrangements, subject to the approval of the Board of Education, for giving boys and girls under seventeen years of age assistance with respect to the choice of suitable employment, by means of the collection and the communication of information and the furnishing of advice." As a result of the two acts the Board of Trade and the Board of Education issued a joint memorandum reserving the right of directing and advising pupils, boys and girls, in regard to employment for six months after they leave school to the education authorities, which are expected through a special subcommittee not only to register applications for work and receive notices of vacancies, but also to induce parents and children to extend the period of education where possible. The Board of Trade meets the expenses of the labor bureau, the director of which it appoints in consultation with the local education authorities.

In Scotland the Edinburgh School Board opened an educational information and employment bureau in 1908, and had the coöperation of employers, organized trades and crafts, and religious, social, and other welfare agencies. At first intent on securing attendance at continuation schools, the bureau soon began to extend its scope to giving advice and securing employment for young people between fourteen and seventeen. In 1909 the Scotch Education Act empowered local school boards to incur expenses for vocational guidance bureaus.

The essential features of vocational guidance are the same in all countries. It is a question of educational administration as much as a social and economic problem. It is intimately connected with the problem of industrial education (*q.v.*). By vocational guidance an attempt is made to save boys and girls from entering the first occupation that offers, regardless of the future it may hold and its effect on health and general well-being. The importance of the life career motive is emphasized, and intelligent planning is encouraged. Through the coöperation of the vocational bureaus and the schools better adjustment between individual ability and bent and the different occupations can be made, while the influence of several agencies can be brought to bear on parent and child to make the sacrifice needed to secure the requisite preparatory training. Record cards of the children's progress at school must be kept on the one hand, and on the other information must be secured about the various occupations, their dangers, their influence, the opportunities offered by them, etc. But it must be constantly borne in mind that it is not the primary function of a bureau or committee for vocational guidance to find employment, but only to act in an advisory capacity on the basis of the information at its disposal.

See Industrial Education.

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VOICE, AND HYGIENE OF THE VOICE. — See Speech; Speech Defects; Vocal Organs. The hygiene of the voice is the hygiene of the lungs, the larynx, and the nose; for these see Nose, Hygiene of; Throat, Hygiene of; Tuberculosis, etc.

VOLAPUK. — See Languages, Artificial.

VOLITION. — See Will.

VOLTAIRE, FRANÇOIS MARIE AROUET DE (1694–1778). — Was educated at the Jesuit College Louis-le-Grand. Here he showed his precocity by writing fair verse at the age of twelve and here he was imbued with a love for letters, with a devotion to the stage, and with the principles of a coldly rational deism. Here, too, he felt the influence of Charles Rollin whose *Treatise on Studies* Voltaire called "a book forever useful." Rollin's reforms were manifest in Voltaire's unsurpassed use of concrete imagery and in his ultimate place as the pope of prosody, the arbiter of literary eloquence. From the Jesuits Voltaire passed into the free-thinking circle of the Temple. Suspected of libels on the Regent he was banished from Paris; returning, and writing more libellously, he was confined in the Bastille. On his release he fled to England. The fruits of this visit were the *Letters on the English* in which the insular toleration in politics, religion, and education was turned into an odious comparison with the Gallic intolerance. The result was the public burning of the book and the self-chosen exile of the author in the independent Duchy of Lorraine. Here was composed much of the *Essay on the Manners and Spirit of Nations* in which a new historical note is struck. Real history is held to be not dry annals or chronicles but a lively portrayal of manners, laws, and arts, and the progress of the human spirit. The educational aim of this work was to diffuse the critical spirit, to discredit the blind acceptance of mere records as facts. Of like aim was the *Philosophy of History* which proclaimed that events are not supernaturally guided, but arise from human opinion and sentiments, the influence of great men, petty accident, "His Majesty Chance."

In the first half of the eighteenth century Voltaire had been a man of letters; with his visit to Frederick of Prussia he becomes a reformer. His watchword was *Ecrasez l'Infâme;* his letters were bullets against bigotry whether in Church or State, in Catholic or Protestant faith. He held that in classical antiquity there had been a steady progress from barbarism to civilization; in the early Christian and medieval epochs a recoil, but a renewed advance in this age of reason. The famous *Philosophical Dictionary, or the opinions of modern philosophers on metaphysical, moral, and political subjects*, was the weapon of attack. In metaphysics the wise man should avoid dogma and be satisfied with agnosticism; in this great edifice of the universe we mice should not trouble ourselves about the architect or the purpose of the building. In morals we should be influenced not by the hope of future heavenly rewards, but by present earthly accomplishment; let us find support in work even if the end be unknown; at all hazards we must cultivate our garden. In politics the axioms are more positive: reform the magistracy; obtain legal and administrative uniformity; demand a milder code of criminal jurisprudence. The last demand was signalized by Voltaire, from his last home near Geneva, in his tireless and successful efforts to secure justice in the infamous cases against Colas, Sirven, and La Barre. These cases disprove the charge that the literary dictator of Europe had no regard for the masses and their wrongs.

Nevertheless, Voltaire's general tone remained more aristocratic than democratic. Hence to replace popular superstition in religion he could offer only a frigid religion of nature, where nature meant the realm of law, not the kingdom of the feelings. In education his sympathies were more rationalistic than sentimental. His ideal was the cult of courtesy, finish in style, perfect good sense. Thus in his *History of Jenni* the youthful hero turns from atheism to theism because it is better form and meets with worldly rewards. Likewise in the *Letters on the New Héloïse* Jean Jacques Rousseau is attacked because of his appeal to the natural man. So Voltaire stands for the highly artificial man, the favorite of court and salon, the polished product of society. He is in style a classicist rather than a romanticist; in temperament a rationalist rather than a sentimentalist; in aims an aristocrat rather than a democrat. I. W. R.

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VOLUNTARISM. — That special form of philosophy in which the will (*voluntas*) is elevated above the other features of the mind to such a pitch that Will is declared to be the deepest Reality; or, again, is declared to be the principal instrument by which we communicate with that Reality.

Voluntarism thus stands opposed to two forms of philosophy: first, to intellectualism, or rationalism, which assigns the chief place to intellect or reason; and second, to the doctrine that feeling, or emotion, is the deepest fact in the world. These different trends may be well illustrated by three modes of describing the nature of God: that He is the Supreme Will; that He is Pure Reason; and that He is Love.

But with the conviction that the basal character of the universe is will, there may well go, as a kind of corollary, the conviction that the right practical relation between the individual and the universe as a whole is to be attained by a proper exercise of will (as, for the intellectualist, the right relation is to be attained by proper thought; and for the emotionalist, by proper feeling). Voluntarism in this way passes readily into a type of ethics, as well as ontology. And in so far as knowledge also is declared to be subject to the will, voluntarism leads to a special type of epistemology. G. M. S.

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VOLUNTARY. — Depending upon the exercise of the will applied to forms of thought or behavior.

See Will.

VOLUNTARY ATTENTION. — See Attention.

VOLUNTARY CONTROL. — See Habit; Instinct; Motor Ability; Will.

VOLUNTARY SCHOOLS. — Those elementary schools in England which have been provided and maintained by voluntary efforts, as a rule, of the respective denominations and which stand outside of the control of local authorities for certain purposes, *e.g.* religious instruction (subject to the conscience clause), appointment of managers, and appointment and dismissal of teachers (within limits). The term used since 1902 in place of voluntary schools is "non-provided" schools.

See England, Education in.

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VULCANOLOGY. — The science which deals with the phenomena of volcanic activity.

See Geology.

VULGARIA. — See Latin Dictionaries, Grammars, etc.; Horman, William; Stanbridge, John; Writing.

WABASH COLLEGE, CRAWFORDSVILLE, IND. — Was founded in 1832, by leaders of the Presbyterian denomination in that vicinity. The college has always been affiliated with that denomination. It is one of the two or three colleges west of the Alleghenies which limits attendance to boys only. The college is well equipped, located on a campus of forty acres, situated in the heart of the city, with five substantial buildings. Admission requires the four years' high school course, and is by certificate or examination. The student attendance for 1911–1912 was 349. The faculty numbers twenty-four.

WADSWORTH, BENJAMIN (1669–1737). — Eighth president of Harvard College; was graduated from Harvard in 1690. He was teacher and later collegiate pastor of the First Church of Boston. He was president of Harvard from 1725 to 1737. "He was eminently pious, and a prudent, faithful minister," but "better fitted for the pastor of a church than to be the master of a school of the prophets," notes John Eliot. W. S. M.

WAFA. — See Abul-Wefā.

WAGES OF TEACHERS. — See Salaries.

WAKE FOREST COLLEGE, WAKE FOREST, N.C. — An institution for men founded by the Baptist State Convention of North Carolina in 1832 and chartered by the General Assembly in 1833 as Wake Forest Institute, in 1838 as Wake Forest College.

Up to 1849 there was no endowment. With the Civil War disappeared most of the small endowment acquired by that time. Since then there has been a prolonged struggle for funds, but in 1883 the college was placed on a sound financial basis. By 1912 the invested funds of the College amounted to more than $455,000, which amount with the estimated value of its real estate makes the aggregate property nearly $650,000. Seven buildings, including gymnasium and hospital, stand on the twenty-five-acre campus.

There have been seven presidents of the College: Samuel Wait (1834–1845), William Hooper (1845–1849), John B. White (1849–1853), Washington Manly Wingate (1854–1879), Thomas Henderson Pritchard (1879–1882), Charles E. Taylor (1884–1905), William Louis Poteat (1905–). From 1882 to 1884 Dr. William B. Royall was chairman of the faculty.

The board of trustees, consisting of thirty-six members, is a self-perpetuating body, nominations to fill vacancies arising within itself. In the absence of any legal restrictions, the trustees are all Baptists. The faculty of instruction consists of twenty-three professors, and eighteen minor teaching officers. The library comprises about 20,000 volumes. Standard entrance requirements of fourteen units are enforced. The total enrollment of students in 1911–1912 was 435. W. L. P.

WALAFRID STRABO (806–849). — A German monk born near Reichenau, where in the monastery he received his early education before he was sent to Fulda. Here he came under the influence of Rabanus Maurus (*q.v.*), and later was sent to Aix-la-Chapelle, where he was tutor at the court. He returned to Reichenau (*Augia dives*) and became its abbot in 842. Strabo was one of the ablest of the disciples of Rabanus Maurus (*q.v.*). He was a careful Latin writer, and he showed considerable skill in versification, his best-known poem being the *Vision of Wettin.* His most popular work was the *Glossa ordinaria* or expositions of the Bible. Another work of his was the *Origin and Development of Ecclesiastical Affairs* (*De ecclesiasticarum rerum exordiis et incrementis*). For some time Walafrid Strabo was thought to have been the author of a *Diary* (*Tagebuch*) which was published in an annual report of the Benedictine monastery at Einsiedeln in 1857 under the title *How they Taught and Studied a Thousand Years Ago.* The work, it was thought, was based on a newly discovered and hitherto unknown Ms. and was given as such in many books, *e.g.* K. Schmidt's *Geschichte der Pädagogik*, Vol. II, pp. 197–213. It was discovered on inquiry, however, that the work was merely a reconstruction based on already existing material to give a picture of the times, much in the same way as the historical novel of *Ekkehard* of Von Scheffel, or *Ratpert* of Zimmermann. The author of Walafrid Strabo's *Diary* was Father Martin Marty, of the monastery at Einsiedeln, who later attained a high position in the Catholic Church in North Dakota.

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WALDECK, PRINCIPALITY OF, EDUCATION IN. — See German Empire, Education in.

WALDEN UNIVERSITY, NASHVILLE, TENN. — A school for negroes founded by the Methodist Episcopal Church in 1866 as the Central Tennessee College, the institution growing out of a mission school started by the Freedman's Aid Society. In time medical, dental, and pharmaceutical departments were added, and in 1900 the title was changed to Walden University, in honor of Bishop Walden of the M. E. Church, to whose interest and activity the institution owed much. A large hospital with every modern equipment was added and dedicated November 29, 1912.

The institution consists of twelve departments, those in addition to the ones mentioned being law, commerce, nursing, music, Bible training, domestic science and art, drawing, and English. While entrance requirements are not beyond the completion of the common school, the institute is one of the best of those for the colored race. The student attendance is about 800, with a faculty of 60 teachers. John A. Kumler, A.M., D.D., is the president.

WALES, EDUCATION IN. — Materials have not yet been collected for a history of education in Wales before its incorporation with England; much of the history after the incorporation is common to the two countries. Only that part which is peculiar to Wales will be treated here.

The Commonwealth Act. — In 1649 the Commonwealth Parliament passed "an Act for the better propagation and preaching of the gospel in Wales and redress of some grievances." Seventy commissioners were named with "full power and authority . . . to receive all articles or charges which shall be exhibited against any parson, vicar, curate, or schoolmaster . . . for any delinquency, scandal, malignancy, or nonresidency" and to require the accused to appear before them. The commissioners could do more than hear charges; "to the end that godly men of able gifts and knowledge for the work of the ministry and of approved conversation for piety may be employed to preach the gospel in the counties aforesaid (which heretofore abounded in ignorance and profaneness) and that fit persons of approved piety and learning may have encouragement to employ themselves in the education of children in piety and good literature . . . the said commissioners" were "authorized and enabled to grant certificates by way of approbation to such persons as" were considered suitable "for the advancement of the gospel or for the keeping of schools and education of children." And the "said commissioners" were authorized out of the ecclesiastical revenues to "order and appoint a constant yearly maintenance for such persons as shall be recommended and approved of as aforesaid . . . provided that the yearly maintenance of a minister does not exceed one hundred pounds and the yearly maintenance of a schoolmaster exceed not forty pounds." The commissioners (mainly through the agency of Vavasour Powel) established over seventy free schools in the chief towns of Wales. Of these the Cardigan Intermediate (formerly Grammar) School, founded in 1653, is probably the only one still existing; most of the rest were closed, on account of the nonconformity of the masters, after the restoration of Charles II.

Thomas Gouge. — Through the influence of Thomas Gouge (*q.v.*), who visited Wales in 1672, over three hundred schools were established, and the New Testament, the *Whole Duty of Man*, and other books were printed in Welsh. His labors having grown too much for him, he formed a Trust. After his death in 1681 its operations gradually ceased, but some of the trustees, profiting by their experience, helped to found the Society for Promoting Christian Knowledge (*q.v.*). (See Charity Schools.)

The Circulating Schools. — Through the influence of one of the original members of that society, Sir J. Philipps, a Pembrokeshire squire, a number of charity schools were established in Wales; in 1746 there were seventy-one, with 1027 boys and 136 girls on the rolls. As a sign of liberality these were creditable; as the means for educating a nation they were wholly inadequate. To supplement them a novel organization was set up by Sir John's brother-in-law, the Rev. Griffith Jones, Rector of Llanddowror (about twelve miles west of Carmarthen). Attracted by his eloquent preaching, crowds attended his church, especially for the monthly sacrament. He used to question them about "all the plain doctrines of Christian knowledge needful to salvation," and having thus discovered their very "brutish, gross, and general ignorance," he resolved, in 1730, to start a school for his own parish. This succeeded so well that he wished every parish to have a similar blessing. Even with subscriptions from pious Englishmen and grants of Bibles from the S. P. C. K. he could have erected few special buildings and created few permanent institutions. He therefore hit on the plan of "circulating" schools. A master was sent to a promising place where there was a church or chapel or empty cottage available. There, without fee, he taught children by day and adults by night to read the Bible. As the pupils were eager and Welsh spelling is phonetic, the simple task did not take long. When it was completed the master moved on to another place, to repeat its performance. From 1737 to 1760, 3185 schools were set up and 150,213 persons were taught. Jones died in 1761, bequeathing his property and his organization to a wealthy widow of his flock, Madam Bevan, who carried on the good work till her own death in 1779, establishing 3280 schools, teaching 163,383 persons. She, in turn, bequeathed money to pursue the plan, but her estate was claimed by a relative and saved only by being thrown into chancery.

Sunday Schools. — In 1783, soon after "Mr. Jones's schools had ceased to circulate," the Rev. Thomas Charles settled in Bala. He repeated Jones's experience, discovering his people's ignorance by catechising, and trying to remove it by setting up circulating schools. His masters, who never exceeded twenty, gradually made themselves unnecessary, for whenever they left, the people arranged to meet for mutual instruction on Sundays. Thus, though the first Welsh Sunday school was not established till a few years after the first English Sunday school, it had an entirely different origin, and Thomas Charles is not more indisputably the father of the one than Robert Raikes (*q.v.*) is the father of the other.

The Education Commission. — The circulating schools, which at best were only a temporary expedient, had ceased before the end of the eighteenth century; the Sunday schools did not teach any secular subject except reading; endowments were scanty; the British and Foreign School Society (*q.v.*) and the National Society (*q.v.*) could not be very successful in stimulating the establishment of schools in a country too poor to maintain them; and the nonconformists generally refused government aid, which, moreover, was not offered till 1833. Hence there were many places without a pretense of a school, and many more with only a private adventure school, which was no better than a pretense. In 1846 the ministry appointed a commission to inquire into the "state of education in the Principality of Wales." The commissioners, though able and conscientious, were young and inexperienced, ignorant of the language and out of sympathy with the religion of the majority of the nation; hence their reports consisted of information about the schools, which was generally accepted as accurate, and of opinions about the people, which evoked passionate protests. The effect on education was that the government continued to offer grants and Welsh nonconformists continued to refuse them. Welsh churchmen, on the other hand, accepted them gladly and supplemented them liberally. In July, 1846, they organized a "Welsh Education Fund" which early in 1847 "amounted to £3000 in donations and £2500 in yearly subscriptions." With these sums, together with grants from the government and from the National Society, training colleges for masters were established at Carmarthen and Carnarvon, and schools were opened for nineteen thousand children.

The Normal College for Wales. — Welsh nonconformists were painfully aware of their country's need before the appointment of the Commission of Inquiry. A hundred and twenty of their leading men met at Llandovery in April, 1845, to consider remedies. They decided that the best was the supply of trained teachers. At the beginning of 1846 a Normal School was opened at Brecon, whence at the beginning of 1848 it was transferred to Swansea, where it languished for a few years. It was foredoomed to failure by the resolution of the managers to refuse state aid. The Welsh people gave generously in proportion to their means for the establishment of the institution, but they could not afford to subscribe year after year sufficient for its maintenance, so that it lived upon its capital and when that was exhausted the principal converted it into a private boarding school.

Secondary Education. — By 1870 experience had taught nonconformists that the evils anticipated from government interference with education were imaginary, so the great act of that year, requiring every district to provide elementary education for all its children, was eagerly welcomed in Wales. But the provision of elementary education served only to emphasize the deficiency of secondary and higher education. The leaders of opinion, conscious of the impossibility of supplying the deficiency themselves, succeeded in inducing the government in 1880 to appoint a Departmental Committee of Inquiry. The committee made a series of recommendations which ultimately resulted in the passing of the Welsh Intermediate Education Act of 1889. This made it the duty of every county council to appoint "a joint committee" "consisting of three persons nominated by the county council and two persons . . . well acquainted with the conditions of Wales and the wants of the people." The function of the committee was "to submit to the Charity Commissioners a scheme or schemes for the intermediate and technical education of the inhabitants of their county . . . specifying in each scheme the educational endowments within their county which in their opinion ought to be used for the purpose of such scheme." When a scheme came into operation, the county could vote a rate of a halfpenny in the pound and the treasury undertook to pay an equal amount. The county councils lost no time. Two months after the act came into operation four joint committees were actually at work, and in six months considerable progress had been made everywhere. When the schemes were approved the joint committees came to an end, and the county governing bodies proceeded to set up schools wherever needed. The county organizations were completed and united by the Central Welsh Board in May, 1896. This body consists of eighty members, three *ex officio*, seventy-one appointed by county councils, county governing bodies, teachers and universities, and six coöpted. The chief function of the board is the annual inspection and examination of the schools, the payment of the treasury grant depending on its report. The success of the act was immediate and thorough. Secondary education was brought within the reach of every child whose parents could afford to pay a very modest fee, and, by means of scholarships, of every clever child whose parents could not afford to pay any fee.

Higher Education. — Mr. (afterwards Sir) Hugh Owen convened a meeting in April, 1854, to consider the idea of a Welsh University College, but it was nearly ten years later before the idea hardened into a definite plan and appeal. Though the response was not very prompt, the Committee could not resist in 1867 the temptation to buy at Aberystwyth for £10,000 a derelict hotel which had cost £80,000 to build. Stone walls do not make a college, and five years elapsed before the Committee ventured to appoint professors and invite students. The College opened in

October, 1872, with a deficit of £2500. Next year the treasury was asked for a grant, but the Chancellor of the Exchequer, while offering profuse sympathy, gave no money. Owen made a fresh appeal to his countrymen, and the result showed both their ingrained love of learning and their poverty, over a hundred thousand subscribers, mostly miners, quarrymen, farmers, and small shopkeepers, contributing £50,000. Even then the College had a hard struggle till the government in 1882 accepted the recommendation of the departmental committee that a grant of £4000 a year should be made. A similar grant was made to the college opened at Cardiff in 1883, and to the college opened at Bangor in 1884. Aberystwyth was granted a royal charter on Sept. 10, 1889, Cardiff on Oct. 7, 1884, and Bangor on June 4, 1885. The three institutions are now flourishing. Aberystwyth has about 500 day students, a college on which £50,000 has been spent, beyond the original £10,000, and laboratories which cost £23,000. Cardiff has over 600 day students, and a college opened in October, 1909, which cost £150,000. Bangor has over 300 students and a college costing £175,000, opened by the King in July, 1911. Women are admitted to each college on the same terms as men, and have at each a hall of residence.

Welsh aspirations could not be satisfied by isolated colleges whose students worked for the external degrees of the London University. A movement for the federation of the three colleges into a university began in 1888, and the royal charter was granted on Nov. 30, 1893.

The Welsh Department. — The creation in February, 1907, of a Welsh Department of the Board of Education with its own permanent secretary and chief inspector is a small indication of the remarkable revival of nationalism which has occurred during the last twenty years, but so small a concession does not satisfy the more ardent nationalists, who demand independence in education as entire as that enjoyed by Scotland and Ireland.

The Welsh Language. — Welsh is the mother tongue of about two thirds of the inhabitants of Wales, but English is the language of business and of the great world. The teaching of English is therefore regarded as the most important work of the schools and within living memory children were often punished for speaking the only language which they knew. But the revival of nationalism led first to the utilization of Welsh in the English lessons and later to instruction in Welsh grammar and literature. The change wrought has been so great that even in towns like Newport and Cardiff, where little Welsh is spoken in the homes, the parents have voted to have it taught in the schools. Formerly the extinction of Welsh was regarded as probable if not desirable; now the preservation of Welsh is regarded as compatible with the diffusion of English. D. Sa.

See Charity Schools; Dissenters and Education.

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WALKER, FRANCIS AMASA (1840–1897). — President of the Massachusetts Institute of Technology and a leader in the manual training movement; was born at Boston on July 2, 1840, and graduated from Amherst College in 1860. He served in the Civil War and rose to the rank of brigadier general. He was instructor at Williston Seminary (1865–1868); assistant editor of the *Springfield Republican* (1868–1869); Chief of the United States Bureau of Statistics (1869–1871); Commissioner of Indian Affairs (1871–1872); professor in the Sheffield Scientific School of Yale University (1872–1881), and president of the Massachusetts Institute of Technology (1881–1897).

General Walker was a member of the city boards of education of Boston and New Haven and the state boards of education of Massachusetts and Connecticut. He was active in the movement that secured the introduction of manual training (*q.v.*) in the public schools. His publications include works on political and social problems, technological education, manual training, and political economy. His *Discussions on Education* was edited by James Phinney Munroe (New York, 1899).

W. S. M.

See Manual Training; Massachusetts Institute of Technology; Technical Education.

WALKER, FREDERICK WILLIAM (1830–1911). — English schoolmaster, born in London and educated at St. Olave's School, Southwark, and at Rugby. He was elected to a scholarship at Corpus Christi College, Oxford, and obtained a first class in *Literae Humaniores* and a second class in mathematics. In 1854 he obtained a fellowship at his college and began to read for the bar, to which he was called in 1858. In the following year he accepted an appointment as High Master of the Manchester Grammar School, then a small provincial school which Walker raised to the foremost rank among secondary day schools in England in equipment, buildings, and numbers. In 1877 he was appointed High Master of St. Paul's School, London, at that time in an inadequate building near St. Paul's Cathedral and having only the 153 foundation scholars according to statute. The staff was doubled, discipline was restored, and natural science and modern studies were introduced. The foundation scholarships were thrown open for competition, and nonfoundationers were admitted. The school under Walker's headmastership became the chief day school in England and had remarkable successes at Oxford and Cambridge. Mr. Walker retired from the school in 1905.

WALKER, JAMES (1794–1874). — Eighteenth president of Harvard University; was graduated from Harvard in 1814, and professor there from 1840 to 1853 and president from 1853 to 1860. He was the author of several school and college textbooks. W. S. M.

WALLIS, JOHN (1616–1703). — A prominent mathematician and teacher of mathematics. He was graduated at Cambridge, and in 1649 became Savilian professor of mathematics at Oxford. He also wrote on philosophy and theology. His works include a treatise on conics (1655) and the *Arithmetica Infinitorum* (1656). The latter is one of the forerunners of the calculus. His *Algebra* (1685) contained one of the first histories of mathematics to appear in England. Wallis also was one of the first to take up the problem of teaching deaf mutes. D. E. S.

WALLS, COLOR OF. — See ARCHITECTURE, SCHOOL; DECORATION OF SCHOOLS.

WALSH, MICHAEL (1763–1840). — Author of mathematical textbooks. He was teacher in the academy at Marblehead, Mass., and author of *Mercantile Arithmetic* (1801), *New System of Bookkeeping* (1826), and other mathematical textbooks. W. S. M.

WALTON, GEORGE A. (1822–1908). — Author of textbooks and school superintendent; was educated in the common schools of Massachusetts and at the Bridgewater Normal School. He was teacher and principal of public schools in Massachusetts, and many years agent of the State Board of Education (assistant superintendent) of Massachusetts. He was the author of *First Steps in Number*, *Written Arithmetic*, *Normal Arithmetic*, and *Practical Arithmetic*. W. S. M.

WANDERING STUDENTS. — See BACCHANTS; BEGGING STUDENTS; CARMINA BURANA; GOLIARDS; MAPES, WALTER; STUDENT LIFE; UNIVERSITIES.

WAR. — See MILITARY EDUCATION; PEACE, EDUCATIONAL ASPECTS OF INTERNATIONAL.

WAR COLLEGE. — See MILITARY EDUCATION; NAVAL EDUCATION.

WARD, EDWARD GENDER (1846–1901). — School superintendent and textbook author; was educated in the normal schools of New York and New Jersey. He was principal of schools at Hoboken, Jersey City, and Brooklyn, and assistant superintendent of schools at Brooklyn. Author of a series of school readers. W. S. M.

WARDEN (Lat. *Gardianus*). — A term adopted by the Franciscans through feelings of humility for the heads of their houses, instead of the traditional *abbot* or *prior*. It was also adopted by several colleges; thus we have the Warden of Merton, of New College, etc.

WARM SPOTS. — In 1884 three investigators discovered independently that warm sensations were not received from all points on the skin, but only from relatively few and scattered spots. Von Frey has estimated that there are on the average 1.3 spots to the square centimeter. The warm spots are stimulated by any temperatures higher than about 32° C., and may also be excited by so-called inadequate stimuli, such as the electric current, and suitable chemicals. No sense organ has been determined for them with any certainty. W. B. P.

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WARREN, SAMUEL EDWARD (1831–1909). — Author of schoolbooks; was graduated from the Rensselaer Polytechnic Institute in 1851, and was instructor there from that date to 1872. He was professor in the Massachusetts Institute of Technology from 1872 to 1875. His publications include *Descriptive Geometry* (1860), *Elementary Projection Drawing* (1861), *Elementary Geometry* (1866), *Freehand and Geometrical Drawing* (1873), *Elements of Descriptive Geometry* (1877), and *Primary Geometry* (1887). W. S. M.

WARSAW, UNIVERSITY OF. — See RUSSIA, EDUCATION IN.

WARWICK SCHOOL, ENGLAND. — See GRAMMAR SCHOOLS; PUBLIC SCHOOLS.

WASE, CHRISTOPHER (*c.* 1630–1690). — Schoolmaster and University Beadle, born at Hackney, London. He was educated at Eton and King's College, Cambridge, the latter of which he entered in 1645. He translated Hugo Grotius's *Baptizatorum Puerorum Institutio* into Greek in 1647, and in 1650 published a translation of the *Electra* into English. On account of his taking the side of King Charles I, he fled first to Holland and was captured whilst on a journey with letters to France. He came back later to England and in 1655 procured his M.A., and became head first of Dedham School in Essex, and about 1660 was appointed to the headship of Tonbridge School in Kent. In 1660 he published *Methodi Practicum Specimen: an Essay of a Practical Grammar,* and in 1662 *Dictionarium Minus: a Compendious Dictionary, English-Latin and Latin-English. Wherein the classical words of both languages are aptly rendered.* Wase became Superior Beadle of Law and Printer or Architypographer in the University of Oxford in 1671, but he did not lose his interest in schools and schoolmasters. There is no book which throws so much light on the grammar schools of his time as his *Considerations concerning Free Schools,* published in 1678. Wase argues against the contention that there were too many schools, remarking "all trades think themselves overstocked." He strongly supports the increase of existing schools, and suggests improvements. He recommends that country schools should seek alliance and supervision from some hall or college in the universities, and gives a valuable list of those grammar schools already in that position. There must be a close relation between the master and the town, so that the master's work is honored. Wase is an advocate of universal education. Every parish should have adequate teaching provision at any rate for "petty" scholars. Writing and arithmetic should each be a *universal advantage,* by which no doubt he means the universality practicable, for he does not, of course, think out the problem of compulsory universal education. F. W.

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WASHBURN COLLEGE, TOPEKA, KAN. — A coeducational institution, chartered Feb. 6, 1865, as Lincoln College, and renamed in 1868. It was founded under the general auspices of the Congregational churches of Kansas, but is wholly independent of church control. The institution maintains (1912) a college of liberal arts, a medical school, a school of law, a conservatory of music, schools of art and oratory, a school of the Bible and a summer school. It also maintains at present a preparatory academy, which is separately organized and managed. Admission to the college is by examination or certificate from an approved high school. Graduates of each department, except the academy and school of the Bible, may receive the appropriate degree, but only on the basis of regular college entrance, and after the full course of special study. The M.A. is granted for not less than one year of study in residence. The college has productive funds (1912) of about $300,000 and a total income, including tuitions, of $65,000. The total number of students in 1911-1912 was 780. The faculty, exclusive of the schools of medicine and law, numbers thirty-nine of whom nineteen are full professors.
F. K. S.

WASHINGTON AND JEFFERSON COLLEGE, WASHINGTON, PENNSYLVANIA. — The outgrowth of an educational movement that was begun in Washington County, about 1780. A classical school was conducted in turn by the three Presbyterian ministers who settled there: Revs. John McMillan, Thaddeus Dod, and Joseph Smith. These three, with Rev. Matthew Henderson, an associate minister, Rev. John Corbly, a Baptist minister, and several laymen, became incorporators of the Washington Academy in the county seat. The charter bears date of Sept. 24, 1787. Benjamin Franklin, of Philadelphia, advised the founders and made the first contribution of fifty pounds for the purchase of books. This academy was opened April 1, 1789, in the courthouse, with Thaddeus Dod as principal. The burning of the courthouse in 1790 and failure to find other quarters led to the suspension of the academy, and a rival academy was founded in Canonsburg, seven miles from Washington. The Canonsburg Academy became Jefferson College with a charter dated January 15, 1802; and the Washington Academy was chartered as Washington College, March 28, 1806.

Many efforts were made to unite these colleges from 1807 to 1865, and in the latter year their union was effected. Part of the college work was to be carried on in Canonsburg and the remainder in Washington, as this was the only form of union that would then be accepted. But four years of trial made it evident that a consolidation in one place must be effected. The charter was amended February 26, 1869, and Washington and Jefferson College has been conducted in Washington since September 22, 1869.

In the year 1911-1912 the faculty consisted of twenty professors and three instructors, and the academy faculty of six. The number of students in attendance was 361. The academy was discontinued at the close of the year. Four years of high school work are required for admission to the freshman class, and classical and scientific courses, covering four years, lead to the degrees of A.B. and B.S. The graduates since 1802 number 4437. The buildings and grounds used for instruction have an estimated value of $462,932, and the endowment amounts to $636,128. J. D. M.

WASHINGTON AND LEE UNIVERSITY, LEXINGTON, VA. — The history of Washington and Lee University dates from 1749, when Augusta Academy was founded. In 1776 the school became Liberty Hall, and was in 1782 incorporated as Liberty Hall Academy, to which George Washington in 1798 donated a number of shares of stock in a canal company given him by Virginia in recognition of his services during the Revolution. This gift brought about the change of name to Washington Academy, later Washington College. General Robert E. Lee became president of the college immediately after the Civil War, and held the office until his death in October, 1870. In 1871 the name Washington and Lee University was adopted. Since that time three presidents have served the college, — General G. W. Custis Lee, 1871–1897, William Lyne Wilson, 1897–1900, and George Hutcheson Denny, 1901–1911. In January, 1912, Dr. Henry Louis Smith was called to the presidency.

The college is situated upon a campus of ninety acres and has twelve buildings. The Carnegie Library building contains the general library of 40,000 volumes, and separate libraries are provided for students of law, engineering, chemistry, physics, and economics. Laboratories, with complete and modern equipment, are established for chemistry, physics, and biology. Three dormitories provide living quarters for part of the students, and a dining hall is conducted on the campus.

There are four divisions of the university, — the college, organized on the elective system, providing courses leading to the B.A., M.A., and Ph.D. degrees; the school of commerce; the school of engineering, embracing courses leading to the degree of Bachelor of Science in civil engineering, mining engineering, and chemistry, and granting the C.E. degree for graduate work; the law school, with courses leading to the LL.B. degree. For admission to full standing fourteen units are required. The student body numbers 630, half of whom are academic students; 20 per cent are in the engineering school; and the remainder in the law department. The students are drawn from twenty-nine states and five foreign countries. The teaching staff numbers forty-two, twenty of whom are professors.

N. D. S.

See Lee, R. E.

WASHINGTON, CITY OF. — See District of Columbia.

WASHINGTON COLLEGE, CHESTERTOWN, MD. — An educational institution chartered as a college in 1782. It was the outgrowth of the Kent County School, founded in 1723. The college led a precarious existence until 1844, since the state appropriations could not be depended upon. From 1844 to the Civil War, however, there was a steady increase in numbers. A new period of prosperity began in 1890, when new buildings were added, and in 1892, when the legislature increased its appropriations. In 1896 a normal department was opened, but this was discontinued in 1910. There are now maintained collegiate and preparatory departments. The entrance requirements are ten units of high school work. The degrees of B.A., B.S., and M.A. are granted by the college. The enrollment of collegiate students in 1910–1911 was 99. The faculty consists of nine members.

WASHINGTON, GEORGE. — See Gentry and Nobles, Education of; National University.

WASHINGTON STATE COLLEGE, PULLMAN, WASH. — A coeducational institution in the extreme eastern part of the state, founded on two national land grants to the state. The first of them was the usual grant of the United States of 90,000 acres of land for a college of agriculture and mechanic arts. The second was a grant of 100,000 acres for a "scientific school," which was intended to be a school of mines, or applied science. These two land grants, aggregating 190,000 acres, protected by a minimum price of ten dollars per acre, for the most part are as yet unsold and are worth to-day five millions of dollars. The Agricultural College, Experiment Station, and School of Science (now the State College) of the State of Washington was accordingly chartered March 28, 1890 and opened June 14, 1892. Its resources are the income on this foundation gift, now small, eventually large; second, its income from the United States of $80,000 a year; third, its income from biennial state grants. The last legislature appropriated for all purposes $535,000, the preceding legislature about the same, and a "mill tax" law has now been enacted which will yield at the outset (1913) about $650,000 a biennium. Beginning with 1913 the income from all sources will be $400,000 a year. The equipment consists of seventeen buildings, a campus of sixty acres, and a farm of over 400 acres, which, with the equipment, are valued at $1,369,000. The college maintains departments for instruction in the sciences, agriculture, engineering, military science and tactics, and the usual academic subjects. Instruction is offered in music and fine arts and oral expression, this work being grouped in the collegiate department of music and fine arts. The entrance requirements are fifteen units of high school work. On the completion of a four-year collegiate course the degrees of B.A. and B.S. are granted. Students may pursue advanced work leading to the degrees of Master of Arts, Master of Science, Civil Engineer, Mechanical Engineer, Electrical Engineer, and Mining Engineer. The faculty, including instructional, investigational, and administrative corps, includes 125 members. J. L. A.

WASHINGTON, STATE OF. — Admitted to the Union in 1889 as the forty-second state. It is the most northwesterly of all the states of the Union, and has a land area of 66,836 square miles. In size Washington is about the same as the six New England states and New Jersey combined. For administrative purposes the state is divided into thirty-eight counties, and these in turn into school districts. In 1910 Washington had a total population of 1,141,990, and a density of population of 17.1 persons per square mile.

Educational History. — The first territorial legislature, in 1854, enacted a school law, which served to organize the schools. This provided for the creation of a school fund and the apportionment of the income on the school census basis; for the levying of county and district taxes for schools, each of two mills; for the election of county superintendents; and for the election of three school directors for each district, who were to care for and maintain the school, for a three months' term each year, and free to all children of the district. The county superintendent was to divide the counties into districts, visit the schools and examine the teachers, enforce the law, and make reports. The school district meeting and district school libraries were provided for. In 1855 two State universities were created, one to be located at Seattle and one at Boisfort Plains, in Lewis County, but neither was established. In 1856 the Methodists incorporated the Puget Sound Wesleyan Institute. In 1858 the legislature voted to unite the two state universities provided for in the act of 1855, and located the new one at Cowlitz Farm Prairie, in Lewis County; but in 1861 this action was also reconsidered, the university was finally located at Seattle, and opened for instruction the following year. In 1860 Whitman Seminary was chartered, and in 1883 this evolved into Whitman College. In 1871 the school law was revised, and a second school law was enacted. The terms of county superintendents were reduced to two years; the annual tax for schools was raised; the office of Territorial Superintendent of Schools was created, to be filled by the legislature benníally, with the usual duties; and a compulsory education law was enacted. There were at this time 189 schoolhouses and 196 schools in the twenty-two organized counties of the territory, with 5928 pupils in attendance. Seattle had but two small school buildings then, and Olympia two district schools. Ten years later there were but twenty-five organized counties, 409 schools, and approximately 15,000 pupils in attendance. In 1873 the law of 1871 was revised so as to reduce the school taxes previously provided for, and the compulsory law was entirely repealed. In 1876 the first uniform textbook law was enacted. In 1881 the school code was again revised, but with no fundamental changes. In 1883 the first high school was organized, at Seattle, but as late as 1890 there were but five high schools in the state.

In 1889 Washington was admitted to the Union, as the forty-second state. There were at that time 1161 school districts, 1349 teachers employed, and 29,247 children in attendance in the state. The state constitution, framed at that time, made full provision for the establishment and maintenance of "a general and uniform system of public schools" for the state, free from sectarian control. The office of State Superintendent of Public Instruction was made a constitutional state office, and all county officers were limited to two terms. The legislature of 1890 merely amended the school law of 1881, to adapt it to state conditions, but without making any important changes. The duties of the State Superintendent were increased, union high schools were authorized, and a new compulsory education law was enacted. The legislature of 1890 also created the Agricultural College, Experiment Station and State School of Science (Washington State College, since 1905); a state reform school; and two state normal schools, at Cheney and Ellensburg. In 1893 a third state normal school was established, at Bellingham. In 1895 a state textbook law was revised, to secure better discounts; and a state school tax of $6 per census child was substituted for county taxation. In 1897 the 1881 and 1890 school code was further revised and amended. Educational qualifications for the office of county superintendent were first established; the granting of teachers' certificates was transferred from the counties to the state; an optional free textbook law was enacted; the formation of joint and union high schools was authorized; kindergartens were made a part of the public school system; and the unification of the higher educational institutions of the state under a board of higher education was provided for. In 1901 the legislature increased the state school tax to $10 per census child, if a state tax of five mills would produce it, and changed the basis of apportionment to an attendance basis. In 1905 a three-mill district tax was required, to secure a six months' school, generally; juvenile courts were created; and cities were permitted to care for their defectives. In 1907 lists of institutions outside the state were directed to be prepared, for interstate recognition of certificates; district school directors' meetings, by counties, were provided for; and the compulsory attendance requirements were extended from three months to the entire school term. An educational commission was also provided for, to thoroughly revise the school code of the state. This reported a revised code to the legislature of 1909, which was in large part adopted. Under the new code of 1909 the laws were revised and systematically arranged; the school districts were classified; the State Board of Education and the Board of Higher Education were consolidated, as were also county boards of education and boards of eighth grade examiners; the minimum school term was made six months for all districts; school physicians were authorized for all first-class districts; a county school tax of $10 per census child was added, and a plan for its apportionment provided calculated to aid the small school; only districts maintaining four-year high schools were allowed independent adoptions of textbooks; a new teachers' certification law was incorporated; and the compulsory school law was extended from fifteen to sixteen years for all children not properly employed. In 1911 a general and continuing state tax for the colleges and normal schools of the state was levied. The tendency of recent legislation has been to materially strengthen both the state and the county, and to curtail somewhat the powers of the district authorities.

Present School System. — At the head of the present state school system of Washington is a State Board of Education and a State Superintendent of Public Instruction. It is the duty of this Board to establish the entrance requirements for the normal schools, the State College, and the State University; to approve all courses of study for the training of teachers in the educational institutions of the state; to prepare a list of accredited normal schools, universities, and life diplomas in other states, the graduates or holders of which may be certificated in Washington, without examination; to examine and accredit the secondary schools of the state; to examine normal training courses in private institutions in the state; to outline a course of study for the schools of the state; to make rules and regulations for the management of the schools, with a view to securing better attendance and increased efficiency; to prepare all questions for the examination of teachers, and to indicate the proper answers to the same; to prepare all questions for the examination of graduates from the grammar schools of the state; to adopt such regulations as will harmonize the work of the different state institutions and unify the work of the schools; and to hear and decide appeals. The State Superintendent of Public Instruction is elected by the people, and is given general supervision over all matters relating to the public schools of the state. He holds an annual convention of the county superintendents of the state for the consideration of educational matters; issues teachers' certificates; requires annual reports from all educational institutions in the state; decides appeals from the decisions of the county superintendents, his decisions being binding, unless overruled by a court of law; prepares and issues the *State Manual of Washington*, a book of general information concerning the state; apportions the school fund and state tax income to the counties, and directs its further apportionment by the county superintendents; has supervision of the examination and certification of teachers; and makes a biennial report to the governor.

For each county a County Superintendent of Schools is elected by the people for two-year terms. He (or she) must have taught two years in the schools of the state, must hold a first grade or higher teacher's certificate, and is ineligible for more than two terms. He is charged with the general supervision of the schools of his county; is to visit the schools, and advise with the teachers and the school officials; to carry out all instructions and decisions of the State Superintendent; to enforce the use of the course of study, as adopted, and the rules and regulations for the examination of teachers and pupils; to alter district boundary lines, and to create new districts; to apportion the school funds to the districts; to approve all schoolhouse plans in third-class districts; to conduct the teachers' institutes and meetings of school directors, as required by law; to require reports from teachers and school officers; and to make an annual report to the State Superintendent. He is assisted in his work by a County Board of Education, whose duty is to grade the answer papers of the pupils in the eighth grade examinations of the county; to assist the County Superintendent in the preparation of manuals, local courses of study, and rules for the circulating libraries; to adopt textbooks for the districts of the county not maintaining a four years' high school; and to adopt rules and regulations for the government of the schools of the county, not contrary to law or to the rules and regulations of the State Board of Education, or the State Superintendent.

Each county is divided into school districts, and these are grouped into three classes. All cities of the first or second class constitute the first-class school districts, and are managed by a board of five school directors; all cities of the third or fourth class constitute the second-class school districts, and are managed by a board of three school directors; and all other school districts not belonging to the above classes constitute the third-class school districts, and are similarly managed by a board of three school directors. All city and town schools operate under the general school law, though larger powers are given to the boards of directors of the larger districts. In 1910 there were nine first-class districts, 195 second-class districts, and 2501 third-class districts in the state. Each board of directors employs all teachers for the district; may elect a building principal, or a Superintendent of Schools; determines the rate of tax to be levied, and reports the same to the county commissioners for levy; enforces the rules and regulations of the county and state superintendents, and the required course of study; may build, remove, or sell buildings or sites when directed by a vote of the people to do so; may provide transportation; and provides all materials, supplies, and books needed for the schools. In first-class districts the directors, in addition, may prescribe a course of study, not inconsistent with the course prepared by the State Board of Education; may organize such additional schools as they deem necessary, and make all necessary rules and regulations for their government; may employ such educational assistants and employees as they deem fit; must employ a district medical inspector; and may spend a sum of money increasing from $50,000 for a district with a population of 50,000, up to $250,000 for a population of 250,000, for purchasing sites and erecting buildings, in addition to the regular tax levy, and without the formal consent of the voters. In all districts maintaining a four-year high school course, the board of directors may select its own textbooks, and may furnish them free when so ordered by a vote of the district. About one fourth of the districts now provide free textbooks.

School Support. — At the time of its admission to the Union, Washington received the sixteenth and thirty-sixth sections of land in each township from the National Government for schools (see National Government and Education), a total of 2,488,675 acres, and on this grant a minimum sale price of $10 an acre was fixed. The 5 per cent fund was also given for schools. A state school fund of about nine millions has been built up so far, largely from the sale of about one eighth of the land. The remaining lands are estimated as worth about $35,000,000, and a permanent school fund of $50,000,000 seems not improbable. A state tax, up to five mills, is levied for schools, and this is intended to produce $10 for each census child in the state. This, together with the income from permanent funds and land leases, is apportioned to the counties and districts on the basis of the total days' attendance in each. In addition, $100 extra is granted for each high school grade maintained, if the average attendance has been four or more. Each county must also levy a county school tax, on the same basis as the state school tax, and this is apportioned, one third on the number of teachers employed, and two thirds on the total days' attendance in each. Each school district board, in any class district, may also levy additional district taxation. The boards of school directors in cities have no financial relations with the city council. Thirty-four per cent of the school revenue, at date of last report, came from state sources.

Teachers and Training. — The state employed 7170 teachers at date of last report, 20.7 per cent of whom were men. For the training of future teachers the state maintains three state normal schools, at Bellingham, Cheney, and Ellensburg, and special teachers' training classes are also maintained at the State University and the State Agricultural College. The University of Puget Sound is also accredited and maintains a normal course. Good interstate recognition of diplomas and certificates is provided. All examinations for teachers' certificates are under the control of the State Board of Education. Cities employing 100 or more teachers, if they so desire, may create a city board of examiners and examine and certificate their own teachers.

Educational Conditions. — More than one third of the total population of the state is in the three cities of Seattle, Tacoma, and Spokane, and nearly one half of the total population is in the ten cities of over 8000 inhabitants. Large areas of the state have but a very small and scattered population, while other large areas present the usual rural educational conditions. About one fourth of the total population is foreign born. The state has made commendable efforts, both in its taxation for education and in its apportionment plans, to provide good financial conditions for the maintenance of its rural schools. There are but few negroes in the state. Nearly all of the school children of the state are enrolled in the public schools. A six months' term, at least, is now maintained in almost every school district of the state.

Secondary Education. — The development of high schools has been rapid during the past two decades. In 1890 there were but five in the state; by 1902 there were seventy-six; and in 1910 there were 307, one third of which were four-year high schools. A union high school law makes detailed provision for the formation and maintenance of a high school by any group of districts, and single districts may provide one or more years of high school work. A state course of study for both the accredited and the non-accredited high schools is outlined by the State Board of Education, and the high schools are examined by a committee of this Board. Sixteen private and denominational secondary schools are also listed as offering secondary instruction.

Higher and Special Institutions. — The University of Washington (*q.v.*), at Seattle, and the Washington State (Agricultural and Mechanical) College, at Pullman, in eastern Washington, stand as the culmination of the public school system of the state. Both are large and important educational institutions. These two are assisted in the work of higher education by Gonzaga College (R.C.), at Spokane (*q.v.*); the University of Puget Sound (M.E.), at Tacoma (*q.v.*); Whitworth College (Presby.), at Tacoma (*q.v.*); and Whitman College (Congr.), at Walla Walla (*q.v.*).

The state also maintains the State Institution for Feeble-minded, at Medical Lake; the State Schools for the Blind and for the Deaf, at Vancouver; and the State Training (reform) School, at Chehalis. E. P. C.

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Reports of the Superintendent of Public Instruction, biennial, 1871-1872 to date. Reports for 1888 and 1889 printed as annuals. First printed report of the Territorial Superintendent, that for 1879.

WASHINGTON, STATE UNIVERSITY OF, SEATTLE, WASH. — A state institution established in 1861 as the result of a movement to secure a federal township land grant, initiated in 1854 by Governor Isaac I. Stevens in his message to the first territorial legislature. The federal census at that time gave the whole population of the territory as 1049, considerably less than half of the present annual enrollment of the University. The regular four-year college course was not formulated until 1877, and the first class was graduated in 1881. The total number of graduates (1912) is 1870. Legislative maintenance appropriations began in 1879, and during the remaining ten years of the territorial period $34,000 was granted the University. With statehood, however, the financial support increased rapidly, and arrangements were made to move to the present commodious campus. Up to 1901 a total of $408,000 had been appropriated, a sum just equal to the annual maintenance ten years later. As organized at present the University comprises the following schools and colleges: arts and sciences, engineering, forestry, law, mines, pharmacy, graduate school, summer school. The standard liberal arts courses are still most largely elected, although the practical courses (notably engineering, mining, and forestry), so much needed in the development of the resources of the rapidly growing state, are emphasized. In several lines the University is coöperating with the United States government, notably in military training, mines rescue training, timber testing, geological survey, and the utilization of forest products. No work below college grade is done, and the standard fifteen units of admission requirements are strictly enforced. The newly organized graduate school will confine its courses until 1914 to those leading to the master's degree except in the single department of chemistry. The physical plant includes a campus of 355 acres on the shores of Lakes Washington and Union. Twenty-one buildings are used for instruction purposes, and a number of others for dormitories, social centers, residences, etc. As a result of the Alaska-Yukon-Pacific Exposition, which was held on the campus in 1909, the University came into possession of an auditorium, an engineering building, and a hall used for chemistry and pharmacy. In addition the University received eight temporary and semi-permanent buildings which have been adapted to educational purposes. The property interests of the University are extensive, including the old University site valued at $3,500,000; land grants of 1893 of 100,000 acres, of which the present estimated value is $1,620,360. Total land endowment is over $10,000,000. The estimated maintenance income for 1913-1914 is $515,000. The enrollment for 1911-1912 is 2632. The faculty number 143, the total teaching staff 180. E. B. S.

WASHINGTON UNIVERSITY, ST. LOUIS, MO. — An educational institution for undergraduate, higher, and professional training, founded in 1853 as Eliot Seminary. In 1857 the name of the institution was changed to Washington University. The charter significantly ordained as fundamental characteristics of the University that it should be absolutely nonsectarian and nonpartisan. The University is coeducational except in the medical and dental schools. The law school was organized in 1867, the school of fine arts in 1879, and the Henry Shaw school of botany in 1885. In 1891 the St. Louis Medical College, founded in 1842, was admitted as a department of the University, as was the Missouri Dental College in 1892. In 1899 the Missouri Medical College, founded in 1840, was united with the St. Louis Medical College to form the Medical College of Washington University. In 1909 the St. Louis School of Social Economy was affiliated with the university. Until January, 1905, the undergraduate work was done in quarters near the heart of the city. The professional work in law, medicine, and dentistry was carried on in buildings within a few blocks of the undergraduate departments. At that time the undergraduate departments (the college and schools of engineering and architecture) were transferred to the group of buildings on the new campus of 170 acres, located in the western part of the city at the west end of Forest Park. In 1909 the law school and the school of fine arts were moved to the same site. It is planned to move the medical school, in the fall of 1913, to new buildings. The Robert A. Barnes Memorial Hospital, a general hospital, and the new St. Louis Children's Hospital are to be erected on an adjoining tract of land, and will be operated in connection with the Medical School. Admission to the college and the schools of engineering, architecture, and dentistry is by certificate, or examination, covering fifteen high school units. In addition to a four-year high school course, for admission to the law school one year of college work, and for admission to the medical school two years of college work in prescribed subjects are required.

The number of faculty members in all departments (fall of 1911) was 172; the total enrollment, 1329; number of bound volumes in the libraries, 122,860; number of pamphlets, 45,619; total assets of the University, $10,572,278. D. F. H.

WATER POLO. — A modern game of ball played in swimming pools by teams of six players. The ball is a rubber bag about eight inches in diameter inflated about two thirds full to permit of holding it with one hand. The goal consists of a board two by four feet, placed at each end of the pool twelve inches above the water. The object is to touch the opponents' goal with the ball, thus scoring five points, or to throw the ball at the goal and score one point. The ball is advanced either by passing to another player or carrying it while swimming. The game is started with the players standing at the ends of the pool, the ball is thrown in the center, and the players dive and race for possession of the ball. The rules permit an opponent to duck the player in possession of the ball and hold him under water until he gives up the ball. This feature, together with the opportunities the game offers for brutal tactics under water, have hindered the growth of this interesting game. These objectionable features have been eliminated in the game as played in England, and a movement is under way to modify the American game in the same direction. With the rapid increase in the number of swimming pools in educational institutions and the growing interest in water sports, there is need for a good aquatic game; water polo will meet that need if it is purged of all brutal and unsportsmanly features. G. L. M.

See Athletics, Educational.

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WAYLAND, FRANCIS (1796–1865). — Fourth president of Brown University; was born in New York the 11th of March, 1796, and died at Providence the 30th of September, 1865. He was graduated at Union College in 1813 and subsequently studied at the Andover Theological Seminary. He was tutor at Union College from 1817 to 1821 and professor there during 1826–1827. From 1821 to 1826 he was pastor of a Baptist Church in Boston.

He was called to the presidency of Brown University in 1827. "The college was in a depressed state; funds were inconsiderable; there was scarcely library, cabinet, or apparatus; and the standard of discipline and scholarship was low." Although its fourth president, Dr. Wayland so enlarged the scope and character of the university that he may be regarded as its founder. Besides administering the affairs of the university, he taught classes in psychology, political economy, and ethics, and "his instruction was in a high degree stimulating to his pupils."

He was one of the organizers and the first president of the American Institute of Instruction, and he was active in the establishment of the Rhode Island reform school. His publications include *Moral Science* (1835), *Political Economy* (1837), *Limitations of Human Reason* (1840), *Collegiate Systems of the United States* (1842), and *Intellectual Philosophy* (1854). His *Reminiscences and Correspondence* was edited by Francis and Heman L. Wayland. (New York, 1867.) W. S. M.

See Brown University.

WAYNEFLETE, WILLIAM (1395–1486).— Schoolmaster, bishop, Lord Chancellor, and founder of colleges and schools, was perhaps the first Englishman who is known to have risen to the highest offices in state and church owing to his success as a schoolmaster. The son of Richard Patyn, alias Barbone, he owed the name by which he was known after becoming a cleric to the name of his birthplace, Wainfleet, in Lincolnshire. It has often been asserted that he was one of Wykeham's first scholars at Winchester College and New College, Oxford. The muniments of these colleges give no support to the assertion. All that is certainly known is that he was educated at Oxford, perhaps receiving both his grammar school and his university education there. He is probably the William Wayneflete admitted scholar, *i.e.* fellow, at King's Hall, Cambridge, March 6, 1428, who as LL.B. accompanied the Warden to Rome in 1429. As Master William Wayneflete he became *Magister Informator*, or headmaster, of Winchester College in 1430. King Henry VI having, under the advice of Chicheley and Bekyngton, who were two of Wykeham's earliest scholars, founded Eton College in 1440 in imitation of Winchester, visited Winchester on Jan. 31, 1441, to study the working of the school. Henry seems to have been so much impressed with Wayneflete that he induced him to leave Winchester for Eton in October of that year. It is not definitely known whether he acted as headmaster at Eton or when the school there was opened, but he was Provost at Christmas, 1442, and from that time took a leading part in the organization of the college. Five scholars and one commoner left Winchester for Eton in 1443, but the full number of seventy scholars was not completed till 1446. On the death of the King's uncle, Cardinal Beaufort, in 1447, Henry secured the election of Wayneflete as Bishop of Winchester. The same year Henry began to rebuild Eton on a larger scale, and Wayneflete was made chief executor of his will for that purpose. In 1454 he was chief of a commission to treat with the King, then insane. In 1456 he was made Lord Chancellor, but resigned after the Yorkist victory at

Northampton on the 7th July, 1460. He took a leading part in obtaining the restitution of Eton after its annexation to St. George's, Windsor, by Edward IV, and from 1467 to 1469 was busy completing the chapel and building the antechapel.

On May 6, 1448, he had obtained license to found "Seint Marie Maudeleyn Halle" at Oxford for a president and fifty scholars. Later, having acquired St. John the Baptist Hospital, he planted in it by deed of June 12, 1458, St. Mary Magdalen College, to which Magdalen Hall surrendered its possessions. The foundation stone of the present building was not laid till May 5, 1474, owing to political troubles. On August 23, 1480, new statutes, copied from those of New College, with few exceptions, were made, and a new president, Richard Mayhew, fellow of New College, was installed with seventy scholars, divided into forty fellows and thirty scholars, called demies from their commons being half those of the fellows. The Renaissance and Humanist character of the foundation may be seen in the protest made against the demies being immaturely diverted to logic and philosophy, with a special provision that two or three of the thirty at least shall go on cultivating "grammar, poems, and the other arts of humanity," so that they may not only become proficient themselves but go on to train others, *i.e.* they were to be trained to become masters in secondary schools. Another notable innovation was the special provision for college, as distinct from university, lectures.

Wayneflete died May 11, 1486, and lies in effigy in the chantry chapel, built by him in front of the Lady Chapel in Winchester Cathedral. A. F. L.

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Statutes of the Colleges of Oxford, 1853.

WAYNESBURG COLLEGE, WAYNESBURG, PA. — A coeducational institution founded in 1850. It is under the auspices of the College Board of the Presbyterian Church. An academy, college, normal, music, and expression departments are maintained. The entrance requirements are approximately four years of high school work. The college confers the degrees of A.B. and B.S. The enrollment of collegiate students in 1910 was sixty-five. The faculty consists of twenty-two members.

WEAK CHILDREN. — See Exceptional Children; Defectives, Schools for; Special Schools.

WEATHER. — See Deportment and Weather.

WEAVING. — See Household Arts.

WEBB, JOHN RUSSELL (1824–1887). — Author of schoolbooks; was graduated from the Albany Normal School and taught in the schools of New York and Indiana. His publications include *John's First Book* (1846), *Word Method* (1864), and a series of school readers and spellers. W. S. M.

WEBBE, JOSEPH. — Educationalist and physician, an M.D. probably of Padua (*fl.* 1612–1633). In 1612 he wrote an astrological treatise, *Minæ Cœlestes Affectus ægrotantibus denunciantis*, published at Rome. He belonged to the class of learned physicians interested in the classics. In 1622 (London) he wrote *An Appeale to Truth*, advocating that in spite of the status and antiquity of grammar teaching, Latin should be learned as nearly as possible as the ancient Romans learned it. He appeals from Grammar-Latin to Latin-Latin, *i.e* learning Latin through Latin authors, not through grammars. Languages can be properly acquired only "by the custom and use *of speaking them.*" Webbe followed up his *Appeale to Truth* by *A Petition to the High Court of Parliament, In the behalf of ancient and authentique Authors, for the universall and perpetuall good of every man and his Posteritie*, in 1623 (London). He shows a real insight into the problems of language teaching, and in spite of the greater renown of Roger Ascham, Montaigne, and Comenius, it is not too much to say that Webbe was, if anything, nearer than those great writers to the present-day views as to the direct method of teaching languages, modern and ancient. Both Webbe and the method for which he stood became obscured in the later part of the seventeenth and particularly in the eighteenth century. He also wrote a tractate on Latin prosody: *Usus et authoritas, id est, liber feliciter incipit, sub titulo Entheati materialis primi hexametra et pentametra*, etc., London, 1626. F. W.

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Watson, Foster. Dr. Joseph Webbe and Language Teaching. *Modern Language Notes*, Feb., 1911.

WEBBER, SAMUEL (1759–1810). — Thirteenth president of Harvard College; was graduated from Harvard in 1784, and became professor of mathematics in the college five years later. He was one of the commissioners appointed by the United States to settle the boundary question between this country and New Brunswick in 1796. He was president of Harvard from 1806 till his death in 1810. He was the author of a number of mathematical works and several scientific papers. W. S. M.

WEBER'S LAW. — The name given by Fechner to a formula which, primarily, connects intensity of sensation with magnitude of stimulus. Fechner had not only found a mathematical expression for the law, but had also carried out extensive experimental researches, before he lit upon its earlier formulation by E. H. Weber. The original statement by Weber (1834) runs as follows: "In comparing objects and observing the distinction between them, we perceive, not the difference between the objects, but the ratio of this difference to the magnitude of the objects compared." In Fechner's phrasing, the law reads: "A difference between two stimuli is always sensed as of the same magnitude, provided that its relation to the stimuli remains the same, however much its absolute magnitude may change"; or "Difference of sensation remains the same if the relative difference of stimulus remains the same"; or again, "The relative differential sensitivity remains the same, whatever the magnitude of the differing stimuli."

Fechner arrived at his mathematical treatment by means of three hypotheses (see Psychophysics). These are: (1) that the single intensive sensation is a sum of units of intensity; (2) that these units are the just noticeable differences of sensible intensity; and (3) that Weber's Law may be transferred from the sphere of sensed differences to that of differences of sensation, *i.e.* from the gross and observable to the infinitesimally small. On these assumptions he sets up a differential equation between intensity of sensation and magnitude of stimulus, between S and R; he then integrates the equation by help of the stimulus limen, *i.e.* of the determination that S vanishes when the value of R is liminal; and he thus obtains the familiar expression $S = c \log R$: "the magnitude of sensation stands in relation not to the absolute magnitude of stimulus, but to the logarithm of the magnitude of stimulus, when the unit of stimulus is defined as its liminal value; that is, as that magnitude at which sensation appears and disappears." This formula, therefore, is not a direct translation into symbols of the facts covered by Weber's Law; it embodies both Fechner's interpretation of that law, and also Fechner's own doctrine of the limen. Weber's Law and Fechner's deduced "metric formula of sensitivity" have, however, often been confused, and the confusion has given rise to much needless controversy. We ourselves have two alternatives to choose from: we may rest content with the bare statement of fact contained in Weber's Law, or we may retain the Fechnerian formula, but reinterpret it as a formula of direct mental measurement (*q.v.*). In the latter event, the expression $S = c \log R$ means that intensive sense-distances, reckoned from some fixed point upon the scale of sensible intensity, are correlated with the logarithm of stimulus-intensities, reckoned from the corresponding point upon the scale of stimulus intensity. Illustrations of Weber's Law in the sphere of supraliminal differences have been given in the article Mental Measurement (the classification of the fixed stars; Ebbinghaus' experiment with gray papers).

Rival hypotheses as to the ultimate meaning and mathematical expression of the law have led to much discussion; but, as a matter of fact, no interpretation of the law is needed. When the correlation of R and S, of stimulus intensity and sense-distance, has been established; when the two terms of the correlation have been analyzed, as minutely as physiological and psychological methods allow; and when the dependence of the numerical results upon variation of conditions has been accurately formulated; then physiological psychology has finished its appointed task. To ask further for the "why" of the correlation is like asking why vibrations of different frequencies are sensed as sound, as warmth, as light: it is to ask a question that science has neither the power nor the obligation to answer. E. B. T.

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Ebbinghaus, H. *Grundzüge der Psychologie.* (Leipzig, 1911.)

Titchener, E. B. *A Text-book of Psychology.* (New York, 1910.)

Experimental Psychology. (New York, 1905.)

WEBSTER, NOAH (1758–1843). — Author of spelling books and dictionaries; was born at Hartford, Conn., the 16th of October, 1758. He was graduated from Yale College in 1778. He taught school at Hartford, studied law, and was admitted to the bar; but "the state of the country was unfavorable to the law business," and he resumed teaching. He taught a classical school at Goshen, N.Y., and began the preparation of schoolbooks. "In the year 1782, while the American army was lying on the banks of the Hudson," he writes, "I kept a classical school at Goshen, N.Y. The country was impoverished; intercourse with Great Britain was interrupted, and schoolbooks were scarce and hardly attainable." The next year he published the first part of his *Grammatical Institute of the English Language, comprising an easy, concise, and systematic Method of Education designed for the use of English Schools in America.* It was a combination of reader, speller, and grammar. His *American Speller*, which grew out of this work, met with unparalleled success and probably more than 75,000,000 copies were sold. His *Compendious Dictionary of the English Language* was published in 1806, and in 1828 he published his *American Dictionary of the English Language*, the title of which was later changed to Webster's *Unabridged Dictionary*, still a popular work of reference. His other publications include *Letters to a Young Gentleman concerning his Education* (1823) and *History of the United States.* He died at New Haven the 28th of May, 1843. W. S. M.

See Dictionaries; Spellers.

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Scudder, H. E. *Noah Webster.* (Boston, 1892.)

WEFA. — See Abul-Wefā.

WEHRLI, JOHANN JAKOB (1790–1855). — Swiss educator, was born at Eschikofen in eastern Switzerland (Canton Thurgau). He received his early education from his father, who was a schoolmaster. After teaching in village schools for two years he was sent by his father to Fellenberg's (*q.v.*) estate at Hofwyl. Fellenberg recognized his ability as a teacher and, in 1810, intrusted him with the education of seven poor and neglected children. This formed the nucleus of Fellenberg's industrial school in which Wehrli labored with increasing success until 1833. From 1813 on, a normal school for country teachers was connected with the institution. The fundamental idea, the basing of education on agricultural labor, was adopted in other places, and so-called "Wehrli-schools" were founded in various parts of Switzerland and elsewhere. Pestalozzi himself watched the experiment with interest and approbation and was surprised that Wehrli, who had never been under his personal influence, had realized his thoughts in such an excellent manner. In 1833 the Canton of Thurgau established a training school for teachers at Kreuzlingen, and Wehrli was placed at the head of it. He remained in this position until 1853, when the state of his health forced him to retire. Two years later he died. Wehrli was not a man of genius, and he lacked the advantages of a higher education; but he was a born teacher with good common sense, the faculty of clear expression, and above all, the spirit of devotion and self-sacrifice, and intense sympathy with the poor. Thus he has an honorable place in the history of education by the side of his greater countrymen, Pestalozzi and Fellenberg.

F. M.

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Rein, W. *Encyklopädisches Handbuch der Pädagogik,* s.v. *Wehrli, Wehrlischulen.*
Seifensieder, J. *J. J. Wehrli, ein Jünger Pestalozzis.* (Fürth, 1896.)

WEIGHT OF SCHOOL CHILDREN. — See Growth.

WELCH, ADONIJAH S. (1821–1889). — Normal school principal; was educated at the University of Michigan. He taught in the secondary schools of Michigan; was principal of the State Normal School at Ypsilanti, and president of the Iowa College of Agriculture. He was the author of *Analysis of the English Sentence, Treatise on Object Lessons, Talks on Psychology,* and *Psychology for Teachers.*

W. S. M.

WELLESLEY COLLEGE. — A college for the higher education of women, situated in Wellesley, Mass., founded by Henry Fowle Durant, a Boston lawyer, and opened to students in 1875. The charter, granted in 1870, bore the name of Wellesley Female Seminary, by later enactment (1873) changed to Wellesley College. Special authorization to confer degrees was given in 1877. The first building, then as now the administration building and largest dormitory of the college, and a music building belonged to the original gift of Mr. Durant. The whole number of buildings now equals about fifty, including separate buildings for chapel, chemistry laboratory, library, gymnasium, dormitories and residences (13), power plant, recreation, service, etc.

Fifteen points of high school work are required for admission. The college confers the degrees of B.A. and M.A. Thirty scholarships, a fellowship with an income of about $1000, and scholarships in schools of special study are open to graduate students. The official control of the College is vested in a Board of Trustees, not exceeding twenty-seven, a majority of whom shall not be of any one religious denomination. The office of the president has been held as follows: Ada L. Howard, Litt.D., 1875–1882; Alice E. Freeman (Palmer), B.A., Ph.D., L.H.D., June, 1882, to December, 1887; Helen A Shafer, M.A., LL.D., 1888 to death, Jan. 20, 1894; Julia J. Irvine, M.A., Litt.D., 1894–1899; Caroline Hazard, M.A., Litt.D., LL.D., 1899–1910; Ellen Fitz Pendleton, M.A., Litt.D., LL.D., 1911–. The officers of instruction and government for the present year (1911–1912) number 182; the students in attendance, 1433. The real and personal estate of the College is valued at $2,682,000, and the endowment at $1,268,938, the latter including scholarship funds of $252,000.

The library, which began with 10,000 well-chosen books from the private collection of Mr. Durant, now equals 71,850 volumes, and includes the Library of American Linguistics, a special gift from Mr. E. N. Horsford, who otherwise endowed the College, and a library of Italian literature, established by Mr. George A. Plimpton.

High standard of scholarship, ample facilities for study and investigation, religious influence, required physical education, location offering proximity to the libraries and museums of Boston and Cambridge, site — a park of 300 acres varied by hill and woodland and bordering upon a lake of more than half a mile in length, inviting to all forms of field and aquatic sports, — constitute a basis for healthful living and symmetrical development.

M. C.

WELLINGTON COLLEGE, ENGLAND. — See College, English; Grammar Schools; Public Schools.

WELLS COLLEGE, AURORA, N.Y. — A college for women founded by Henry Wells, incorporated in 1868 as Wells Seminary, and chartered as a college in the year 1870. In August, 1888, the main building and the college library were destroyed by fire. A new building was immediately erected, and several others have been added from time to time. Besides the main dormitory there are five cottages for the accommodation of instructors and students; not more than fifteen live in any one of the cottages. The value of the grounds and buildings at present is $460,000; the endowment, $338,000.

In the year 1911–1912 the number of students enrolled was 208, and the faculty consisted of thirty-two members. Following the policy of the founder, Wells College has remained a small college, its trustees and friends being fully convinced that in the modern system of education there is a place and a need for the smaller college. The student body is largely self-governed. The student activities express themselves through various societies, social, religious, literary, and musical. Outdoor sports — rowing, basket ball, tennis, etc. — have a large part among the recreations.

The entrance requirements of the college are those of the College Entrance Examination Board. The course of study allows of a minimum of elective work during the freshman year and an increasing amount during the succeeding years; in the senior year the work is entirely elective. The opportunities for a healthful out-of-door life in the surrounding country are among the advantages peculiar to the situation of the college. K. K.

WELLS, DAVID AMES (1828–1898). — Author of textbooks on science; was graduated from Williams College in 1847. He served an apprenticeship on the *Springfield Republican*, after which he took a course in science with Louis Agassiz (*q.v.*) in the Lawrence Scientific School, graduating in 1851. He was instructor in physics and chemistry at the Groton Academy and engaged in general lecture work and propaganda for the introduction of science in elementary and secondary schools. His publications include *History and Sketches of Williams College* (1847), *Science of Common Things* (1857), *Elements of Natural Philosophy* (1857), *Principles of Chemistry* (1858), *First Principles of Geology* (1861), and many works on political science. He edited with notes Benjamin Brodie's *Psychological Inquiries* (1857). W. S. M.

WELLS, WILLIAM HARVEY (1812–1885). — Normal school principal and superintendent of schools. He was instructor in the teachers' seminary at Andover, Mass., principal of schools at Newburyport, Mass., and principal of the State Normal School at Westfield, Mass. From 1856 to 1864 he was city superintendent of the schools of Chicago. He was one of the organizers of the Massachusetts Teachers' Associations. He was the author of *Graded Course of Instruction for Public Schools*, and a series of grammars. W. S. M.

WENCKEBACH, CARLA (1853–1902). — German-American educator. She was graduated from the normal school for women at Hanover, and after teaching for several years in Germany, Russia, Belgium, and England, came in 1879 to the United States. In 1881 she was appointed professor of German at Wellesley College, which post she held until her death. Her influence in the organization of courses in German in American secondary and collegiate institutions was great. She also organized and conducted the first courses in the history and theory of education given at Wellesley College. Her publications include *Lesebuch*, *Anschauungsunterricht*, *German Grammar*, *Litteraturgeschichte*, and numerous articles on the study of German. W. S. M.

See German, Study of.

Reference: —

Müller, Marguerite. *Carla Wenckebach, Pioneer.* (Boston, 1908.)

WESLEY, JOHN (1703–1791). — The evangelist and Methodist leader, was born at Epworth. He was early educated by his mother, and at the age of eleven he entered Charterhouse School and in 1720 was elected scholar of Christ Church, Oxford. He was graduated B.A. in 1724, was ordained in 1725, and in 1726 became fellow of Lincoln College. Though loyal to Charterhouse and Oxford, where he had been trained, yet he considered their education seriously defective. Large towns, he thought, tended to distract from learning; masters and miscellaneous schoolfellows were frequently indifferent to religion. Elementary subjects were neglected for the classics; these were poorly taught and often instilled what was obscene. There are "even some schools of note wherein no Hebrew is taught." In 1738 he saw what seemed to him ideal Christian schools in Jena, Halle, and among the Moravians in Herrnhut. Ten years later at Kingswood, near Bristol, he founded a school to carry out ideas developed from what he had seen.

Boys were not received after the age of twelve, because they might by then be rooted in bad habits. (Later experience reduced the age to nine!) They were taught in eight classes, and the syllabus included "reading, writing, arithmetic, English, French, Latin, Greek, Hebrew, history, geography, chronology, rhetoric, logic, ethics, geometry, algebra, physics, music." Wesley also sketched out a four-year academic course to follow, and concludes "if those of tolerable capacity do not advance more here in three years than the generality of students in Oxford and Cambridge do in seven, I will bear the blame forever."

The school still exists for the sons of Methodist preachers and a long line of distinguished alumni take pride in Wesley's words still carved on its walls. *In gloriam Dei Optimi Maximi, In usum Ecclesiæ et Reipublicæ.*

W. T. A. B.

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Jackson, T., Editor. *Wesley's Works* (5th ed.). (London, 1860 and 1881.) Many references, see Index, Vol. XIV, specially Vol. XIII, pp. 283–302.

Three Old Boys. *History of Kingswood School.* (London, 1898.)

WESLEYAN COLLEGE, RICHMOND. — See London, University of.

WESLEYAN FEMALE COLLEGE, MACON, GA. — A college for women opened in 1837 as the Georgia Female College; the oldest chartered college for women in the world. It is under Methodist control. A conservatory of music and subcollegiate courses are maintained in addition to the college. The entrance requirements are fourteen units. The courses in the college lead to the degrees of A.B. and B.S. The number of students of college rank in 1911–1912 was 113. The total present enrollment is 412.

WESLEYAN UNIVERSITY, MIDDLETOWN, CONN. — Established by legislative charter in 1831 under the auspices of the Methodist Episcopal Church. At first the proficiency of the student was made the only basis of classification, but the four classes were recognized as early as 1836, and the definite four years' course with all studies required was announced in the catalogue of 1841. The efforts of the presidents who immediately succeeded President Wilbur Fisk (1830–1839) were directed to improving the financial conditions and extending the resources of the college. In 1872 and 1873 the curriculum of the college was modified and extended by the adoption of the elective system; and in the fall of 1872 the college was for the first time opened to women. During the presidency of Rev. Cyrus D. Foss (1875–1880) all accumulated deficits were paid, and the productive funds of the college were increased by about $250,000. During the presidency of Rev. Bradford Paul Raymond (1889–1908) the college continued to make rapid progress; large gifts for buildings, scientific purposes, and endowment were received; in 1908 the permanent fund amounted to one and a half million dollars; and at the close of this administration the total property of the college amounted to over two and a half million dollars. President Raymond was succeeded in 1909 by Rev. William Arnold Shanklin. During the college year 1911–1912 an effort to increase the endowment resulted in subscriptions of somewhat over one million dollars, of which about one third has already (August, 1912) been paid.

The productive endowment of the college now amounts to $1,800,000, to which the amounts already subscribed will, in the next four years, add about $800,000. The value of the buildings, grounds, and material equipment of the college by the last report is $1,101,086. The college library contains 91,000 volumes, and is supported by a special fund of $100,000. The faculty at present numbers thirty-nine. The number of students listed in the last catalogue is 410. After much agitation on the part of undergraduates and alumni the trustees in 1909 voted that no women should be admitted to any class later than that entering in 1910. The last women students were graduated in 1912.

Although founded by members of the Methodist Church, Wesleyan University has never been a narrowly denominational institution, and by the original charter no religious restrictions could be imposed on any officer of the University. Unfortunately, in 1870, the revised charter required the majority of the faculty and trustees to be members of the Methodist Church; but this illiberal requirement was annulled in 1907, and the charter thus restored to its original liberal character. In 1910 the University was placed on the list of colleges receiving the benefits of the Carnegie Foundation for the Advancement of Teaching.

Although christened at its birth a "university," Wesleyan has been in its methods and aims a college. It is, moreover, a "small college." Believing that the results of distinctively college training can best be attained in a smaller rather than in a larger institution, the authorities of Wesleyan neither expect nor desire an attendance of more than about five hundred students. Without allied professional schools or provisions for advanced university studies, Wesleyan aims to maintain the requirements of admission and the standards of scholarship characteristic of the best New England colleges.

C. T. W.

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Wesleyan University. *Celebration of the Seventy-fifth Anniversary.* 1831–1906. (Middletown, 1907.)

Historical Sketch. *Alumni Record*, 1911.

WESSEL, JOHANN (1420–1489). — Early humanist scholar, born at Groningen and educated at the School of the Brethren of the Common Life at Zwolle. He studied in Paris and traveled in Italy, where he learned Greek. He also acquired a knowledge of Hebrew. In 1473 he returned to Paris and taught there, numbering Rudolph Agricola and Reuchlin (*qq.v.*) among his pupils. The latter part of his life was spent in a monastery near Groningen. Wessel had many of the characteristics of the Brethren under whom he was educated; intensely pious, he revolted against the flagrant abuses of the church, and in many points his theological views find an echo in Luther; with his strong religious and moral earnestness he combined a love of culture and placed the classics by the side of the Bible and the Church Fathers. On those who came into contact with him he seems to have exercised a profound influence. He was known to his contemporaries as *Lux Mundi* and *Magister Controversiarum.*

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BARNARD, H. *American Journal of Education*, Vol. XXVIII, pp. 714–716.

WEST INDIES, EDUCATION IN THE SMALLER ISLANDS OF. — The larger islands of the West Indies, Cuba, Haiti, Jamaica, and Porto Rico, have been considered individually under their names. The small islands belonging to France are treated under the head of French colonies. There remain five islands or groups of small islands belonging to Great Britain and one group belonging to the Netherlands, which have well-established systems of public instruction.

In the British possessions referred to, the first schools were due to the efforts of various religious denominations. In origin and development the history of the island governments, in respect to the education of the people, reflects the movements in the mother country.

In the Bahamas an act was passed in 1847 providing for the employment of a schoolmaster from the Training College of the British and Foreign School Society (London) at a salary of £200 a year. The master selected seems to have performed the duties of a general school inspector for nearly twenty years, and under his supervision the schools were organized after the model of those of the parent society. The education act of 1864 provided for an official inspector who should serve as secretary to the Board of Education, and, also, for the employment of additional teachers from the London training college. In 1878 limited compulsory classes were added to the education act, and in 1886 a comprehensive act was passed for the administration of the dual system of public free schools and denominational schools; the former being supported entirely by public funds, the latter in part by private resources.

In the Barbados, interest in the education of the natives became marked after the Emancipation Act, which went into effect in 1838, but a legislative grant for schools was not made until 1846. The first general education act was passed in 1850; the act under which the schools are at present managed dates from 1890 with amendments in 1897. The schools are denominational, but supported chiefly by public funds. Codrington College at Bridgetown, the capital city, is affiliated with Durham University, England.

The ordinance of 1901, with subsequent amendments by which the school system of Trinidad is regulated, provides for a board of education appointed by the governor, who is himself the president of the board. This body administers the public grant, determines whether a proposed public school is necessary, and issues general regulations for the conduct of schools, public and assisted. The governor also appoints school inspectors. The ordinance requires that secular instruction shall be given in the English language; but this provision cannot be fully carried out, as the natives speak chiefly Spanish and French.

The administration of schools in the Windward and Leeward Islands is governed by ordinances of 1889 and 1895 respectively. These acts determine the conditions upon which schools may receive government support and provide for the service of inspection. In addition to the schools included in the following table an industrial school and an agricultural school are maintained on the island of Dominica, the largest of the Leeward group, and an agricultural school on the Windward Islands.

The following table summarizes the statistics given in official reports for 1911: —

ISLANDS	POPULATION, 1911	SCHOOLS, GOVERNMENT, AND AIDED		GOVERNMENT APPROPRIATIONS	UNITED STATES EQUIVALENT
		Number	*Number of Pupils*	£	$
Bahamas	55,941	64	7,827	6,000	29,160
Barbados	171,982	175	17,464	19,209	93,355
Leeward	127,189	153	13,744		
Trinidad	330,074	263	47,661	50,476	245,313
Windward					
Grenada		47	9,624	4,955	24,081
St. Lucia		53	7,254	4,492	21,831

The Bermuda Islands, although not included in the West Indies, are similar in general conditions and in past history. They have a population of 18,994, of which a little more than one third (6690) are white. A board of education appointed by the governor has the general direction of the schools. In 1911 there were twenty-seven primary schools with 2016 pupils. The government grant for the schools amounted to £1636 ($7950). The government also maintains three garrison and two naval schools, and there are, besides, numerous private schools. The Cambridge local examinations are held in the island, and a scholarship yielding £150 a year for two years enables candidates for the Rhodes Scholarships to prepare for the examination. Bermuda had three students on the Rhodes Fund at Oxford in 1911. The Bermudas belong to the diocese of the Bishop of Newfoundland, and while the schools are not denominational, they are under the direction of the vestry of the several parishes.

The possessions of the Netherlands in the West Indies consist of six small islands having a combined area of 403 square miles and a total population (1909) of 752,741. Of this number, 30,930 belong to Curaçao, the largest island. The schools are supported in part by the government, but are under denominational control. They numbered in 1910, thirty-five, with about 5700 pupils. A. T. S.

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Annual Reports of the Boards of Education of the several islands.
Education laws and ordinances.
England, Board of Education. *Special Reports on Educational Subjects*, Vol. XII. (London.) Gives detailed history of education in the islands.

WEST POINT MILITARY ACADEMY. See MILITARY EDUCATION.

WEST VIRGINIA, STATE OF. — Carved from Virginia in 1861, as a war measure, and admitted to the Union in 1863, as the thirty-fifth state. It is located in the South Atlantic division, and has a land area of 24,022 square miles. In size it is about half as large as New York. For administrative purposes the state is divided into fifty-five counties and eight independent cities, and the counties in turn into school districts and subdistricts. In 1910 West Virginia had a total population of 1,221,119, and a density of population of 50.8 persons per square mile.

Educational History. — The early educational history of West Virginia has been traced under the article on the school system of Virginia (*q.v.*). Much less was done under the early Virginia legislation in the counties to the west of the mountains than in Virginia proper, and but little before the Virginia law of 1846. Even as late as 1860 but three West Virginia counties had organized schools under the optional Virginia law of 1846. As in Virginia, the chartering of academies began early, and between 1797 and 1862, sixty-five academies were chartered by the state, a few of which later evolved into colleges and two of which (Marshall Academy, in 1837, and West Liberty Academy, in 1838) have since been adopted by the state and changed into state normal schools. The schools of Shepherdstown date from 1846, and the schools of Wheeling from 1849, and a few other town and city schools date from before 1860, but most of the city school systems date from 1864, or later.

In the constitutional convention of 1862 a committee on education was appointed, which drew up a detailed plan for a state school system. This was later incorporated in the first school law, enacted in 1863, while only the essential outlines of the plan were incorporated into the new state constitution of 1862. The new constitution directed the legislature to " provide by law for a thorough and efficient system of free schools," and to " foster and encourage moral, intellectual, scientific, and agricultural improvement "; provided for a State Superintendent of free schools, county superintendents of schools, and other necessary educational officers; carefully defined the sources and use of a new permanent state school fund; and specified the means of support for schools. In 1863 the " act providing for the establishment of a system of free schools " was passed, and the first State Superintendent was elected in June, 1864. The city schools of Charleston and Fairmont were begun in 1864, and the beginnings of county organization were made, though, owing to the continuance of the war, little was accomplished until after the restoration of peace. In 1867 the trustees of Monongalia College (established as an academy in 1814) voted to turn the institution over to the state to organize the West Virginia Agricultural College, and in 1868 this institution was further expanded into the University of West Virginia. In 1867, to meet the urgent need for teachers of some training, the state established two state normal schools. In 1870 a third school was added, and 1872 saw three more established.

In 1872 a new state constitution was adopted. This retained all of the educational provisions of the constitution of 1863; made more detailed provision in some cases; provided for a poll tax of one dollar for free schools; for county and district tax levies; ordered separate schools for the two races; forbade the creation of additional state normal schools; put limitations about the creation of independent free-school districts; and directed that provision be made for the proper education of the blind and mute. In 1873 a new school law was adopted, carrying the new constitutional provisions into effect, though no marked changes in organization were made by it.

The period up to 1880 has been termed the period of the establishment of the free school system. The system was but meagerly supported, and the older generation questioned the need for and value of much that was proposed. The normal school system was the center of attack, and in 1877, 1879, and 1881 the friends of the normal schools were compelled to defend them vigorously from legislative assaults. In 1881 another new school law was enacted, but again with no marked changes in organization or scope. In 1885 women were admitted to the State University for the first time. In 1887 a rudimentary child labor law was enacted. In 1889 the West Virginia boys' reform school was established at Pruntytown, and in 1897 a similar school for girls was established at Salem. In 1890 the West Virginia Colored Institute, an agricultural and mechanical school for negroes, was established, under the provisions of the Morrill grants. In 1891 a graded course of study for country schools was adopted. In 1895 a branch university preparatory school was established at Montgomery, and a state high school for colored students (the Bluefield Colored Institute) at Bluefield. A textbook law was also enacted in 1895, and amended in 1897. In 1901 the State Teachers' Reading Circle, which up to this time had amounted to little, was evolved into an important educational institution. In 1903 uniform examinations for teachers' certificates were substituted for the county system, and a permissive free textbook law (by districts) was enacted. The West Virginia school improvement league, an organization which has done much to awaken interest in schools, was formed in 1904. In 1906 a state educational commission was appointed by the governor, to revise and amend the school laws of the state. In 1907 the school term was increased from five to six months; a tax of ten cents for high schools was authorized; and a commission of five was created to consider the desirability of grouping the different state institutions under a more centralized management.

The special session of the legislature in 1908, acting on the report of the educational commission, enacted the largest amount of important legislation secured in decades, and completely revised the school law of the state. The recommendations of the State Superintendent for a decade were finally enacted into law. The new code provided for the consolidation of schools; increased the minimum teachers' salaries; created a new State Board of Education, which superseded the State Board of Examiners; interstate reciprocity in certification was begun; graduates of universities and normal schools were made eligible for certification on their diplomas; primary and high school teachers' certificates were created; graded and high schools were authorized to be established by any town, and district high schools by vote of the people; district supervision was permitted; the compulsory education law was strengthened, the age limits were increased from eight to fourteen to eight to fifteen, and for a six months' term; and the child labor law was amended to correspond. A bill making an annual state appropriation from the school fund to aid poor districts in maintaining a six months' school was also enacted by the legislature. In 1909, also, acting on the report of the commission on state institutions, the legislature abolished the different boards of control for each, and substituted a State Board of Regents of five for the management of all the state educational institutions, and a State Board of Control of three for the management of the penal, reformatory, and special educational institutions, and for the financial control of all institutions. A state schoolbook commission was also created, to adopt a uniform state series of textbooks; and agriculture was added to the list of statutory school subjects, and to the list of examination subjects for teachers' certificates. In 1911 additional legislation, strengthening the system, was enacted.

Present School System. — At the head of the present state school system of West Virginia is a State Superintendent of Free Schools, and a number of different state boards. He has general supervision of the work of the county, city, and district superintendents of the state; sees that the school system prescribed by law is carried into effect, and is in uniform operation throughout the state; interprets the school law, his interpretations being binding until overruled by a court of law; apportions the state school fund and the state aid to poor districts; classifies the high schools of the state, and apportions the state aid to them; prescribes the standards for graduation from the schools; has general regulation, direction, and control of the examination and certification of teachers, and issues all teachers' certificates; appoints the instructors and arranges the times for the county teachers' institutes; outlines the teachers' reading circle course; and makes a biennial report to the governor and to the legislature. The State Superintendent is assisted in his work by the state inspectors of high schools and rural schools. The State Superintendent also appoints five educators, one from each congressional district, and not over three from the same political party, who, together with himself, constitute the State Board of Education. This Board performs the duties formerly performed by the State Board of Examiners, and also constitutes a commission on courses of study for the schools. The Board outlines all courses, prepares all questions for the examination of teachers, and examines all answer papers. The Board also holds an annual examination for state professional certificates; may recognize certificates from other states; and makes an annual report to the State Superintendent on its work. A State Board of Control has the financial and business management of all of the state institutions, and apportions the state funds to each; while a State Board of Regents has control of the educational work of all the state educational institutions. The State University, the two state preparatory schools, the six state normal schools, and the two institutions for colored students, come under the control of this Board of Regents. A State Textbook Commission selects uniform textbooks for the elementary schools of the state. All of these state boards must be bipartisan.

For each county a County Superintendent of Free Schools is elected by the people, for four-year terms. Independently organized districts, under district superintendents, are not under his supervision. He must visit each school in his county at least once each year, and examine the school, the instruction, and the building. He acts as agent for the State Superintendent and the State Board of Education in the examination of teachers; approves plans for new school buildings, and for the repair or sale of old ones; settles disputes as to districting or as to boundary lines, on the appeal of six citizens; apportions the county school fund to the districts; conducts a county teachers' institute, under the direction of the State Superintendent; receives reports from the district authorities; and transmits an annual report to the State Superintendent.

Each county is divided into districts, and these in turn into subdistricts. Each magisterial district in the county (these may vary from three to ten in number) is a school district, for which a district board of education is elected by the voters. These boards have general control of the schools of the district; may change district lines, or increase or decrease the number; determine the number and grade of schools to be maintained, and the number of teachers to be employed; may establish graded schools, or high schools; must provide buildings, apparatus, and supplies; appoint the trustees for the subdistricts, and may remove them for cause; appoint a district truant officer; and make an annual report to the county superintendent. Each subdistrict, white or black, has three trustees, appointed by the Board of Education, for three-year terms, one each year. These trustees have general charge of the subdistrict school. They appoint the teachers and make contracts with them; must visit their schools at least twice each year, and inspect the buildings, teacher's register, and progress of the pupils; are to purchase supplies for the schools, employ the janitor, and make needed repairs; and act generally under the supervision of the District Board of Education. On the petition of 75 per cent of the voters, boards of education may abolish subdistricts and consolidate schools. A number of the towns and cities are organized as independent school districts, by special acts of the legislature, and differ in their forms of organization and in the powers possessed. Fifty-eight such acts had been passed by 1908, and eight cities are listed in the State Superintendent's reports as on a par with the counties in organization.

School Support. — The permanent state school fund has been limited to $1,000,000, on which about 5 per cent is obtained. This, together with a capitation tax of one dollar, levied on all males for schools, the net proceeds of all fines and forfeitures, the income from all sources intended in the original constitution to go into the permanent school fund, and a sufficient appropriation from the state treasury to make $750,000, constitute the annual state appropriation for schools. From this sum the salaries of the state and county superintendents are first deducted, and also a reserve fund of $75,000 for aid to weak districts to enable them to maintain a six months' school, and $15,000 for aid in building school buildings. The remainder is distributed to the counties, and thence to the districts, on school census. The balance needed to maintain the schools comes from district taxation, which cannot exceed twelve and one half cents for the building and general expense fund, and twenty-five cents for the teachers' fund. Towns having graded or high schools may levy more, and ten cents may be levied for high school purposes. Any board of education may propose to the voters the authorization of a higher tax levy. If the maximum tax of 25 cents will not provide a six months' school, at the state schedule of teachers' salaries, the state superintendent is to apportion a sufficient amount from the $75,000 reserve fund.

Teachers and Training. — The state employed 8782 teachers for its schools in 1910, 365 of whom were colored. Of the teachers of the state, 47.4 per cent were men. The same year there were 7010 white and 303 colored schools in the state. For the training of future teachers the state maintains six normal schools for whites and one for colored pupils, as follows: the State Normal Schools at Athens, Fairmont, Glenville, and West Liberty; the Marshall College State Normal School, at Huntington; the Shepherd College State Normal School, at Shepherdstown; and the West Virginia Colored Institute, at Institute, on the Great Kanawha River. These offer both normal and secondary instruction. One-day district institutes, and five-day summer county institutes, are established features of the state school system, and a state teachers' reading circle has recently been evolved into an important feature. A state minimum salary law requires salaries of $40, $35, and $30 per month for teachers holding the three grades of teachers' certificates.

Educational Conditions. — Despite marked recent advances, the schools of the state are still in a somewhat backward condition. The state is essentially rural, and relatively poor as yet, though with large undeveloped resources. The expenditures for education, though below the average for the United States as a whole, are nevertheless large as compared with the other Southern states. The population is largely rural (81.3 per cent), white (95 per cent), and native born (97 per cent). The state is behind most of the Southern states in the matter of industrial training, though agriculture has recently (1909) been made a required subject in all schools. The people are much in earnest about education, but the relative poverty of the state and the strength of the district system alike retard educational progress.

Secondary Education. — The graded school and the high school have made much progress during the past two decades. The number of graded schools has increased from 161 in 1890, to 813 in 1900, and to 1073 in 1910, and the number of high schools from 20 in 1890, to 39 in 1900, and 106 in 1910. Of the number in 1910, 74 graded schools and 7 high schools were for the colored race. In 1907 local taxation for high schools was first authorized; in 1908 their formation generally was authorized, and in 1911 the first state aid was granted. All must provide a nine months' term, and are subject to inspection by a state high school inspector. Of the 106 high schools in 1910, 41 were four-year schools, and 20 were three-year schools. The state maintains two branch preparatory departments of the State University, at Montgomery and Kayser, and a state secondary school for colored students (Bluefield Collegiate Institute). The six state normal schools and the colored agricultural and mechanical school also offer secondary instruction.

Higher and Special Education. — The West Virginia University, at Morgantown (*q.v.*), stands as the head of the educational system of the state. Three denominational colleges, open to both sexes, assist the State University in providing collegiate instruction. These are Bethany College, at Bethany (Christian); West Virginia Wesleyan College, at Buckhannon (Methodist Episcopal); and Davis and Elkins College, at Elkins (Presbyterian). Storer College, at Harpers Ferry, is a secondary industrial and collegiate institution for the colored race.

In special institutions the state maintains the West Virginia Reform School for Boys, at Grafton; the West Virginia Industrial Home for Girls, at Industrial; and the West Virginia Schools for the Blind and Deaf, at Romney.

E. P. C.

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State Constitutions, 1863, 1872, and amendments.
Whitehill, A. R. *History of Education in West Virginia.* (U. S. Bur. Educ., *Circ. Inf.* No. 1, 1902.)

WEST VIRGINIA, UNIVERSITY OF, MORGANTOWN, W. VA. — A coeducational institution, founded in 1867 as the Agricultural College of West Virginia, by the incorporation of Woodburn Seminary, in existence for fifty years, with the land grant from the national government. In 1868 the name was changed to West Virginia University, the "board of visitors" to the "board of regents," with the provision that vacancies in the board should be filled by the Governor. Under an act of 1909 the financial and business affairs of the University and of all the other state educational institutions are controlled by a state board of control consisting of three members appointed by the Governor. The academic control of the University and also of the other distinctly educational institutions of the state is vested in a single board of regents, which is bipartisan and consists of the state superintendent of free schools (*ex officio*), who is elected by the people, and of four other members who are appointed by the Governor and are responsible to him for the proper conduct of their duties.

For many years the growth of the new institution was very slow and uncertain. This was due to many causes, including the partially local foundation, the sectional questions which had divided Virginia long before the war, the new sectional jealousies, the postbellum political questions and partisanship, the lack of a satisfactory system of secondary schools, the divided responsibility and *laissez-faire* policy, and the lack of means of communication with Morgantown. Gradually the importance of those causes was reduced by changing conditions. In the transformation of the earlier school into a real college, the most prominent factors have been the improvement of the normal schools, the recent development of better secondary schools, resulting largely from industrial progress in the state. Women were first admitted to the college of arts and sciences in 1889, and were admitted to other departments in 1897. The five departments with which the University started in 1867 have increased to more than twenty-five by expansion and differentiation. The dates of the establishment of the special colleges and schools now comprised in the University are as follows: the college of law, 1878; the college of engineering, 1887; the agricultural experiment station, 1888; the college of agriculture, 1897; the school of music, 1897; the school of fine arts, 1897; the school of medicine, 1900; the school of agriculture, 1911.

Entrance requirements are fifteen units, except to the college of agriculture, which requires only fourteen. The time required for graduation is four years, except in the college of law, which in 1909 lowered its standard to three years, but will return to four years in 1913. The total enrollment in 1911–1912, including 614 enrolled in the "schools" was 479, of whom 449 were candidates for degrees. The total number in the college faculty in 1911–1912 (exclusive of assistants, library staff, and experiment station staff) was sixty-eight, of whom thirty-seven were full professors.

J. M. C.

WESTERN COLLEGE FOR WOMEN, OXFORD, OHIO. — See Oxford College for Women.

WESTERN COLLEGE SOCIETY. — See Educational Associations; Teachers' Voluntary Associations.

WESTERN LITERARY INSTITUTE AND COLLEGE OF PROFESSIONAL TEACHERS (1831–1845). — This was one of the earliest educational associations in the United States; and if the date of the organization of the Western Academic Institute (1829), out of which it grew, be taken as its beginning, it may be regarded as the earliest of the American educational associations, since the American Institute of Instruction (*q.v.*) was not organized until 1830. Henry Barnard writes concerning it: " It was not only one of the earliest educational associations in our country, but also proved itself to be one of the best, one of the most active, energetic, and laborious, and one of the most practical and widely influential." The Western Academic Institute was organized at Cincinnati in 1829, largely through the exertions of Albert Picket and Alexander Kinmont.

Annual gatherings of from three to five days were held after the incorporation of the Western Academic Institute into the Western Literary Institute (1831), and the proceedings of the first ten conventions were printed. While largely represented by the four states of Ohio, Indiana, Illinois, and Kentucky, the association had a scattered membership in many states of the Union. Among the active workers were such well-known educators as Lyman Beecher, Thomas S. Grimke, Henry Barnard, Calvin E. Stowe, W. S. Johnson, Samuel Lewis, Samuel Galloway, Elias Loomis, Joseph Ray, and Edward D. Mansfield (*q.v.*). The names of a number of women appear in the proceedings, including Emma Willard, Catherine E. Beecher, Almira Lincoln Phelps, and Lydia H. Sigourney (*q.v.*). W. S. M.

WESTERN MARYLAND COLLEGE, WESTMINSTER, MD. — A coeducational institution organized in 1867 and chartered in 1868. The College gives but one degree, Bachelor of Arts. The course of study extends through four years, and divides in the junior year into classical, historical, and scientific, all leading to the same degree. Supplementary courses are offered in pedagogy, leading to a certificate from the State Board of Education, and in piano, voice, and elocution. The College has a library of 8000 volumes, a gymnasium and chemical, biological, and physical laboratories. There are twenty-one instructors, and 822 alumni, and the annual enrollment averages 240. There have been two presidents: Rev. James Thomas Ward, D.D., Sc.D., from the beginning to 1886, and Rev. Thomas Hamilton Lewis, D.D., LL.D., from 1886 to the present.

T. H. L.

WESTERN RESERVE UNIVERSITY, CLEVELAND, OHIO. — Founded as Western Reserve College in Hudson, Ohio, in 1826, and later removed to Cleveland, and refounded as Western Reserve University. The University now includes eight departments: Adelbert College, undergraduate, for men; the College for Women, undergraduate; the Graduate School; the Medical School, graduate; the Law School, graduate; the Dental School; the Library School; the School of Pharmacy. The undergraduate colleges, the Graduate School, the Law School, and the Library School are situated upon the main campus on Euclid Avenue. Upon the Adelbert College part of the campus are the Amasa Stone Memorial Chapel, the Hatch Library, the Main Building, the Physical Laboratory and Astronomical Observatory, the Biological Laboratory, the Morley Chemical Laboratory, Eldred Hall (Y. M. C. A. Building), Adelbert Hall (a dormitory for men), the Gymnasium for Men, and the Athletic Field. About the quadrangle of the College for Women are situated the Florence Harkness Memorial Chapel, Clarke Hall (for recitations and lectures), the Flora Stone Mather Memorial Building (for administration and recitations), Guilford House and Haydn Hall (halls of residence), and the Gymnasium for Women. The School of Pharmacy and the Dental School are downtown. The three buildings of the medical school are in the city, and occupy a site devoted for two thirds of a century to the study of medicine. The law school became a graduate school when new requirements for admission came into effect in 1911.

Recent gifts to the University have included, in buildings, the Morley Laboratory of Chemistry and Geology, the Amasa Stone Memorial Chapel, the Flora Stone Mather Memorial Building, and, in funds, $100,000 for establishing the chair of political science, $75,000 as a foundation for the chair of sociology, $500,000 for additional instruction and for raising salaries in the undergraduate colleges, $200,000 for establishing the chair of experimental medicine in the medical school, and $1,000,000 for additional endowment for the medical school. The grounds, buildings, and equipment of the University are now valued at about $3,500,000. The endowment funds total about $3,500,000.

The opportunities for general and special training include a series of combined courses. The arts-medical course requires seven years. The arts-law course is combined in six years.

By special arrangement between Western Reserve University and Case School of Applied Science, students may complete the combined course in a total of five years, receiving the degrees of A.B. and B.S.

The University serves also an outside constituency. In addition to special lectures given at the University free public lectures and extension courses are given. Through certain departments the University is seeking to aid in the solution of municipal, state, and national problems.

The faculties and other officers numbered, in 1911–1912, 212 persons. The student body numbered 1300. The University is on the Carnegie Foundation list of accepted institutions, and is a member of the College Entrance Examination Board. Charles Franklin Thwing, LL.D., has been president since 1890.

WESTERN UNIVERSITY OF PENNSYLVANIA, PITTSBURGH, PA. — See Pittsburgh, University of.

WESTFIELD COLLEGE, WESTFIELD, ILL. — A coeducational institution, founded in 1865 under the auspices of the United Brethren Church. Besides the college, an academy, and schools of music, commerce, and finance are maintained. The entrance requirements are sixteen units. The college confers the degrees of A.B., B.S., and B.S.D. (bachelor of scientific didactics). The enrollment of collegiate students in 1910–1911 was sixty-four. The faculty consists of ten members.

WESTFIELD COLLEGE (FOR WOMEN). — See London, University of.

WESTMINSTER COLLEGE, FULTON, MO. — Founded in 1849 as Fulton College, the present title being adopted in 1853. The college is under the auspices of the Presbyterian Church of Missouri. An academy is maintained in addition to the college. Fifteen units of high school work are required for entrance. The degree of B.A. is conferred by the college, and certain courses are recognized for the purpose of the state teachers' certificate. The enrollment of collegiate students in 1910–1911 was 67. There is a faculty of thirteen members.

WESTMINSTER COLLEGE, NEW WILMINGTON, PA. — A coeducational institution, chartered in 1852 as the Westminster Collegiate Institute. The present title was obtained by charter in 1897. The college is under the control of the United Presbyterian synods of the West and of Pittsburgh. Preparatory, collegiate, music, and art departments are maintained. The entrance requirements are fifteen units of high school work. The degrees of A.B., B.S., Ph.B., and A.M. are conferred. The enrollment in 1912–1913 in the collegiate department was about 220. The faculty consists of twenty-five members.

WESTMINSTER SCHOOL, or ST. PETER'S COLLEGE, WESTMINSTER, ENGLAND. — One of the nine great Public Schools (*q.v.*) of England. The early history of the school is buried in obscurity. Though it cannot be affirmed with certainty, it may be that the founding of the school was contemporaneous with the establishment of Westminster Abbey. While it is possible that some sort of school may have been attached to the Abbey, nothing definite is known until 1540, when Henry VIII changed the monastery to a college of secular canons and provided for two masters and forty scholars. This school continued until its refoundation in 1560 by Queen Elizabeth. Among its masters were Alexander Nowell, who wrote a catechism and introduced the plays of Terence into the school to purify the Latin in use there, and Nicholas Udal, famous as the author of the first English play and as the flogging master of Eton. Elizabeth refounded the school in 1560 and provided for two masters and forty scholars. The interest of the Queen was marked by her interference in the election of scholars (known as Queen's scholars), and in appointing a lay headmaster. By the statutes the annual salary of the headmaster was fixed at £12, and then £20, with £1 10*s.* for his gown and £6 1*s.* 8*d.* for commons, and for the second master at £7 6*s.* 8*d.* for salary, 13*s.* 4*d.* for his gown, and £6 1*s.* 8*d.* for commons. The headmaster was to be appointed by the Dean of Christ Church College, Oxford, and the Master of Trinity College, Cambridge, with the approval of the Dean of Westminster Abbey. The Queen's scholars had to be boarders and had to be in school a year before they were eligible for a scholarship. Town boys, as distinguished from the scholars, were also admitted and a few (pensioners) boarded at the school. Since the number increased without provision being made for extra teachers, tutors were appointed to look after the scholars and pensioners. The school was connected with the universities by the establishment of three scholarships at Christ Church, Oxford, and three at Trinity, Cambridge. Pupils were not admitted to the school unless they were eight years of age and had a knowledge of writing and elementary grammar. The curriculum was modeled in general on that of Eton with a greater amount of Greek, begun earlier in the school, which was divided into seven forms. Before additional teachers could be appointed some of the older boys were put in charge of the lower classes; and in time, at the end of the century, their place was taken by an usher. As in many other schools of the time, a Latin play was given annually, but unlike other schools, Westminster has retained this feature to the present.

While no restrictions were placed upon the appointment of the headmaster, the practice, so common in many schools, of appointing an alumnus began in 1599 and continued for two centuries. The first headmaster of note was Lambert Osbaldeston who encouraged the study of English, Cowley being a product of his time, and taught geography for one hour in the week during the summer. Osbaldeston was succeeded in 1640 by the famous Richard Busby (*q.v.*), who joined the school as second master in 1638, survived the difficulties of the Civil War, and weathered the restrictive political and religious measures until 1695. In 1649 the control of the Chapter was annulled and an act of Parliament was passed to provide for the separate government and maintenance of the school. Busby, while known mainly for the use of the rod, was a strong headmaster and an earnest teacher. Under his supervision Greek, Arabic, Hebrew, and English grammars were specially written for the school; geometry and arithmetic were introduced for those who had a taste for them; and for a time two hours a week were given to music. Throughout this century the school records are remarkable for the number of great divines there educated. During the period immediately following, the school was as notable for the number of prominent political leaders among its alumni. Throughout the century the number of pupils increased rapidly. New buildings were added, and to provide accommodations dames' houses were established in the neighborhood of the school during the headmastership of Robert Freind, when there were 400 boys in the school. Under John Nicoll, Freind's successor (1733–1753), it seemed almost as if a new era in education was to begin, for the rod was replaced by confidence and trust, care was taken of the religious education, and the school continued to be preëminent in scholarships. In 1750 cricket was introduced into the school, and the first Eton-Westminster match took place in 1796. In the second half of the eighteenth century the noble patronage gradually began to fall away; different educational ideals were springing up; and new schools were being established. But efforts were made to introduce some reforms. Thus under William Vincent (1788–1802) elementary science and mathematics with calligraphy and arithmetic were taught on half holidays. But the school declined withal, and at the beginning of the last century there were less than 100 boys in the school. In a large measure the Chapter was to blame; not only was there an utter neglect of the needs of the school, but funds which rightly belonged to it were diverted to other purposes. But the revival and reforms which were going on in all other English schools did not fail to have their effect on Westminster. In 1846 Henry George Liddell was appointed headmaster and in nine years raised the numbers from 90 to 140. School discipline was restored and better masters were employed. At the same time the Dean of Westminster was active in putting the school buildings into better repair. Under Liddell's successor, Charles Brodrick Scott (1855–1883), the school again reached its position among the leading schools of the land. New buildings were erected and better classroom accommodation was provided. As a result of the Schools Inquiry Commission the Chapter was compelled to provide more adequate funds, and by the Public Schools Act (1868) a new governing body was appointed. With the provision of more space, more money, and a new governing body the school rapidly forged ahead.

By the Public Schools Act of 1868 the school was made independent of the Chapter in its finances and was put into possession of its own buildings and grounds, which were vested in a new governing body. The controlling voice was thus withdrawn from the Chapter. Proposals were made at this period to remove the school from London, but were never carried through. Dr. Scott was succeeded in 1883 by Dr. William Gunion Rutherford who retired in 1901, when Dr. James Gow was appointed. The school numbers 300 boys, a portion of whom are boarders. The classes are small and are divided into classical and modern sides. Since its revival the school has established its claim to rank among the leading English public schools.

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WESTON, EDWARD PAYSON (1819–1879). — State superintendent of schools; graduated from Bowdoin College in 1839. He was principal of academies at Lewiston and Gorham, Me.; state superintendent of Maine; principal of the Abbot School at Farmington, and principal of secondary schools in Illinois. For several years he was editor of the *Maine Teacher.* W. S. M.

WEYMOUTH COLLEGE, ENGLAND. — See COLLEGE, ENGLISH; GRAMMAR SCHOOLS; PUBLIC SCHOOLS.

WHEATON COLLEGE, WHEATON, ILL. — A coeducational institution opened in 1854. An academy, a college, a conservatory of music, and schools of commercial art and domestic science are maintained. The entrance requirements are fifteen units. The college grants the degree of A.B. The enrollment of students of collegiate grade in 1911–1912 was 83; and the academy attendance 115. The faculty consists of twenty members.

WHEELOCK, ELEAZAR (1711–1779). — Founder and first president of Dartmouth

College; was graduated from Yale in 1733, studied divinity, and was pastor of a church at Lebanon, Conn., for thirty-five years. He organized a school in his family for the education of youths who wished to prepare for the ministry. By 1762 he had twenty students under his tuition, mostly American Indians. It was known as Moor's Charity School — Josiah Moor, a Lebanon farmer, having given his house and two acres of land for the use of the school. One of the students, and afterwards associate teacher, was Samuel Occum (*q.v.*), a Mohican Indian, who distinguished himself as a teacher and preacher.

Dr. Wheelock decided to enlarge his school and sent Samuel Occum and Nathaniel Whitaker to England to solicit funds. The Earl of Dartmouth became the chairman of an endowment fund for the Indian missionary college and ten thousand pounds were raised. The institution was removed to Dresden (now Lebanon), N.H., in 1770, where a large landed endowment was offered to the new institution by John Wentworth, the royal governor of New Hampshire. He remained at the head of the college until his death in 1779. His publications include *Narrative of the Indian Charity School at Lebanon* (1762). W. S. M.

See Dartmouth College.

WHEELOCK, JOHN (1754–1817). — Second president of Dartmouth College and son of Eleazar Wheelock (*q.v.*), the founder and first president of the college. He studied at Yale College and was graduated in the first class at Dartmouth in 1771. He became a tutor in the college the next year; and with the outbreak of the Revolutionary War he joined the Continental army and rose to the rank of colonel. Upon the death of his father in 1779, he succeeded him as president of Dartmouth, which position he held for thirty-six years. His publications include *Sketches of the History of Dartmouth College* (1816). W. S. M.

See Dartmouth College.

WHEWELL, WILLIAM (1794–1866). — English scholar and educator, the son of a master carpenter at Lancaster. He was educated at the Blue School and the Grammar School, Lancaster, and later (1810) at the Haversham Grammar School, whence he passed to Trinity College, Cambridge, in 1812. In 1815 he was second wrangler and in 1817 became fellow of Trinity and assistant tutor in the following year. He at once joined the movement to raise the standard of university education. He turned to the new analytical methods in mathematics and introduced new school and university textbooks, and took with Airy a part in the awakening of Cambridge mathematics. He was elected a Fellow of the Royal Society in 1820, was ordained in 1825, and in 1826 became the first professor of mineralogy. In 1841 he became Master of Trinity and was regarded as the best master since Bentley. In 1837 he published his *History of the Inductive Sciences*, followed in 1840 by *Philosophy of the Inductive Sciences.* In 1837 also came his *Principles of English University Education*, in which was reprinted *Thoughts on the Study of Mathematics as Part of a Liberal Education* (1835). *Of a Liberal Education in General, and with Particular Reference to the Leading Studies in the University of Cambridge* appeared in 1845, reprinted in 1850 with an additional part on the recent changes at Cambridge and in 1852 with a third part dealing with the revised statutes for Trinity, issued in 1847. In 1848 Whewell brought about the creation of the Moral Science Tripos and the Natural Science Tripos, which, however, were not recognized for degrees till 1860. On the question of university reform, to which he had devoted himself for thirty years, he felt that effective reform could take place only from within. His doctrine of "internal reform" and independence from state interference led to the progress of Cambridge, and indirectly of Oxford. To this end he sat on the syndicate appointed to revise the university statutes (1849–1851). Amid all his public activity he still found time for apparently endless original research. His book *Of the Plurality of Worlds*, maintaining that one world alone is inhabited, appeared in 1851, and in 1854 he published two brilliant works on education: *On the Material Aids of Education*, and *On the Influence of Science upon Intellectual Education.* In all he produced forty-three works besides innumerable memoirs on mathematics, science, and philosophy. Among his latest efforts for Cambridge and Trinity was his gift of land and buildings worth £100,000 for the establishment of scholarships (the Whewell Scholarships) at Trinity.

Whewell's labors in the direction of new educational methods, in the exacting work of educational administration, and lastly as an educational theorist place him among the first of English educationalists. His work *On the Principles of English University Education* (1837) falls into three chapters or sections: (1) of the subjects of university teaching; (2) of direct and indirect teaching; (3) of discipline. In the first chapter he distinguishes between speculative and practical teaching, viz., teaching in which the pupil has not or has an active part to play. Practical education, Whewell holds, is the better instrument "for that kind of culture on which civilization depends," a position which he supports by apt historical illustrations, *e.g.* the decay which followed the return to the speculative by the medieval universities. At the same time "Greek and Latin are peculiar and indispensable elements of a liberal education." With their disappearance, our past and all that it means disappears. But classical and mathematical studies must be combined as subjects of university teaching. Science cannot replace mathematics, but science connects the mind with the future as much as ancient literature connects it with the past, and therefore "some insight into the progressive sciences is an essential part of a liberal education in any large sense of the term." Under "direct and indirect teaching" Whewell discusses the growing disposition "to conduct our education almost entirely by examinations (*i.e.* indirect teaching) and to consider the lectures given in the colleges as useful only in proportion as they prepare the student for success in examinations." Whewell had no sympathy with indirect teaching instead of that relationship between a pupil and the subject which is personal, willing, and direct. "Examinations are a means not an end . . . a sound and liberal cultivation of the faculties is the object at which we ought to aim." In the chapter on discipline Whewell deals with the value of college and university life and the corporate opinion as a training for the life of the greater world. The later work *Of a Liberal Education in General* (1845) deals in greater detail with the subjects and methods of university teaching. The address, delivered at an Educational Exhibition on July 10, 1854, *On the Material Aids of Education* deals with education "as the means of a general human culture" and defines education as "the process of making individual men participators in the best attainments of the human mind in general, namely, in that which is most rational, true, beautiful, and good." For rationality language is necessary, and in this respect the material aids are books; for truth the truths of science must stand among the means of teaching; for beauty we turn to literature or music or the other arts; for goodness we have to look to the ideal man and that moral and religious training which is the material means of education on their side. The lecture *On the Influence of the History of Science upon Intellectual Education* was reprinted in a volume entitled *Lectures on Education* (1854) and is also included in *Modern Culture*, a collection of essays edited by E. L. Youmans (New York, 1866). J. E. G. de M.

See Cambridge University.

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WHITBREAD, SAMUEL (1758–1815). — English politician, born at Sardington, Bedfordshire. He was sent to Eton and later to Christ Church College, Oxford, and St. John's College, Cambridge, where he took his B.A. in 1784. After a foreign tour of several years he returned to England and devoted himself to politics. As a member of the House of Commons he proved a strong opponent of all kinds of oppression and abuses. He favored the emancipation of the negro, the extension of religious and civil rights, and the establishment of national education. In 1807 he brought forward "A bill for the promoting and encouragement of industry among the labouring classes of the community, and for the effectual relief and regulation of the criminal and necessitous poor." The bill contained several measures of relief. When this bill was abandoned, Whitbread brought in some of the clauses as separate bills, one of these including the compulsory establishment of parochial schools where the children of parents too poor to pay for their education could attend for two years between the ages of seven and fourteen. The magistrates were to provide the school buildings and appoint teachers, while the supervision was to be in the hands of the parson. Occupiers of land and buildings were to be taxed to maintain the schools. The bill met with considerable opposition both on the ground of cost and the general opposition to the education of the lower classes lest they should become dissatisfied with their lot. It is interesting to notice that Whitbread advocated the use of the monitorial system "by which the object of learning must be infallibly attained with expedition and cheapness and holding out the fairest prospect of utility to mankind." Whitbread's bill was only the forerunner of many proposals which finally culminated in the act of 1870.

See England, Education in.

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WHITE, EMERSON ELBRIDGE (1829–1902).—School superintendent; educated in the schools of Ohio and at Cleveland University. He was principal of schools in Cleveland; superintendent of schools at Portsmouth; state superintendent of public instruction in Ohio; president of Purdue University, and superintendent of the schools of Cincinnati. He was one of the organizers of the National Education Association and its president in 1872. His publications include a series of school arithmetics, *Elements of Pedagogy*, *School Management*, *Art of Teaching*, and *Promotions and Examinations in Graded Schools*. He was editor of the *Ohio Educational Monthly* from 1861 to 1870 and the *National Teacher* from 1870 to 1875. He also contributed many papers on educational subjects to the proceedings of educational associations and school journals. W. S. M.

WHITGIFT, JOHN (*c.* 1530–1604). —Archbishop of Canterbury, born at Great Grimsby and educated at St. Anthony's School, London, and at Pembroke Hall, Cambridge. He was graduated B.A. in 1553–1554 and took holy orders in 1560. His power as a preacher soon attracted attention, and he gained both academic and ecclesiastical preferment. He was for a short time master of Pembroke Hall, and in the same year was elected to a similar position at Trinity College. In 1570 he became vice-chancellor and was instrumental in bringing about the defeat of the Calvinists and the domination of the Anglican Church. He was one of the chief promoters of the new statutes (1570) of Cambridge University (*q.v.*) which were intended to concentrate academic power in a few hands. In 1576–1577 Whitgift became Bishop of Worcester, and in 1583 Archbishop of Canterbury. He was a great favorite with Queen Elizabeth, and her strongest supporter in the policy of securing religious uniformity. In 1595 he founded at Croydon a hospital dedicated to the Holy Trinity and a free school for a warden, schoolmaster, and at least twenty poor men and women. The foundation is still maintained, and includes the hospital, with thirty-nine poor persons, and two schools, the Whitgift Grammar School with 435 boys (145 in the preparatory school), and the Whitgift Middle School with 210 boys.

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WHITMAN COLLEGE, WALLA WALLA, WASH. — A coeducational institution founded as Whitman Seminary in 1859 in memory of Marcus Whitman, M.D., one of the early missionaries west of the Rockies. Work was begun in 1866. The collegiate charter was obtained in 1882. The entrance requirements are sixteen units of work. Baccalaureate degrees in arts, science, and music are conferred. The enrollment in 1910–1911 was 241. The faculty consists of twenty-eight members. A conservatory of music is situated on a separate part of the campus, but is not an integral portion of the college.

WHITNEY, WILLIAM DWIGHT (1827–1894). — Philologist and textbook author; graduated from Williams College in 1845. He subsequently studied at Yale College and the universities of Berlin and Tübingen. He was professor at Yale from 1854 to 1894. His publications include *German Reader* (1869), *Language and the Study of Languages* (1872), *Life and Growth of Language* (1875), *English Grammar* (1877), *Sanskrit Grammar* (1879), *French Grammar* (1886), and *Forty Years' Record of the Class of 1845 of Williams College* (1885). He was joint author with Professor Edgren of *Compendious German and English Dictionary* (1877), and he published many papers on philological subjects. W. S. M.

WHITWORTH COLLEGE, TACOMA, WASH. — A coeducational institution incorporated as Sumner Academy in 1883 and as Whitworth College in 1890. It is under the auspices of the Presbyterian Church. There are maintained an academy, a college, and schools of music, art, expression, and domestic science. The entrance requirements are equivalent to the work of a high school. The degrees of A.B. and B.S. are conferred by the college. There is a faculty of twenty members. The enrollment of students of collegiate rank in 1912–1913 was eighty-one.

WHOOPING COUGH (PERTUSSIS). — Whooping cough — a serious contagious disease thought to be due to Bordet's bacillus. Recent investigations indicate that the locus of the infection is around the cilia of the epithelial cells at the top of the trachea. The symptoms are a spasmodic straining cough characterized at a later period, perhaps from the tenth to the fortieth day, by a whoop or vomiting or both. The period of incubation is from six to fourteen days, and the cough is likely to last some six weeks or more. The prevailing opinion is apt to be that whooping cough is not serious, and in some places children ill with the disease are permitted to continue in school. Statistics, however, indicate that it is often fatal and that the mortality in the early years of life is as great as that from diphtheria, scarlet fever, or measles, or greater. Most of the cases occur in the early years of life. In 1908, for the registration area in the United States, the death rate for whooping cough was eleven per one hundred thousand, and the total number of deaths reported from the disease, 4969. An extended study for fifteen years in the city of Brünn, Switzerland, gives the following table based on 2763 cases, which shows the incidence of morbidity and mortality according to age.

MORBIDITY AND MORTALITY FROM WHOOPING COUGH ACCORDING TO AGE

	0–1 Year	1–3 Years	3–6 Years	6–14 Years	14–20 Years	20–30 Years	30–40 Years	40–50 Years	50–60 Years	60–70 Years	Over 70 Years
Cases . . .	496	790	978	394	8	7	—	—	—	—	—
Deaths . . .	117	68	18	1	—	—	—	—	—	—	—

The disease seems to be usually spread by contact, but experiments have shown that cats may contract the disease, and it may be spread by them and perhaps by other animals. Dr. Mehnert has reported good results from inoculating infants suffering from whooping cough with ordinary cowpox vaccine. As the kinepox develops, the cough subsides, and disappears altogether in fourteen days. This method is recommended by him as of double value, — immunization against smallpox and the cure of whooping cough. Almost innumerable remedies have been proposed, but there is no generally recognized specific.

It is important to emphasize the danger from this disease in the early years of life. In some quarters it is not included among the list of contagious diseases for which children are excluded from school. It should, however, be ranked with scarlet fever and measles, and a record should be kept of all children who have not had the disease, and the same precautions taken in the case of measles should be adopted. Parents should be notified, children should be excluded from school, and should not be permitted to return until the cough, at least the characteristic whoop, has disappeared. In a kindergarten or elementary grade it probably is better to close the school when the first case appears, if a considerable number of the children are susceptible.

The period of quarantine is sometimes given as forty-two days from the beginning of the whooping, or more if the spasmodic cough continues, or less if there is recovery. Dr. Hermann gives the period of isolation as twenty-one days for mild cases, fifty-six days for severe cases. The disease is seldom if ever carried by a third person. Members of the family who have had the disease are not usually excluded. W. H. B.

See Measles; Contagious Diseases; Exclusion from School; Medical Inspection.

Reference : —

See the handbooks on the diseases of children and the recent files of the *Jahrbuch für Kinderheilkunde.*

WICHERN, JOHANNES HEINRICH (1808–1881). — Founder of the *Rauhe Haus* (*q.v.*) and of the "Inner Mission," and leader in many forms of philanthropic work. Born and educated at Hamburg, he studied at Göttingen and Berlin. He became director of a free Sunday school at Hamburg in 1832, and founded the *Rauhe Haus* (*q.v.*) and the institution for training the "brothers" or social workers in 1833. In 1848 he published a *Memorial to the German Nation* as a result of which a committee was formed at the Evangelical *Kirchentag*, and organized the Inner Mission (*Central-Ausschuss für die Innere Mission der deutschen Evangelischen Kirche*). In connection with this movement societies have been formed throughout the country to meet local needs as they arise. The general society maintains Houses of Brothers and Sisters (training schools for philanthropic work); a number of lodging houses; Sunday schools; schools for the care of children; asylums for fallen women; houses for the sick; day nurseries; boys' clubs, and labor bureaus, etc. Through the Mission an evangelical movement has been started among university students to promote Christian life. The organ of the Mission is the *Fliegende Blätter aus dem Rauhen Hause*, established by Wichern. In 1848 Wichern was called by the Prussian government to take charge of 10,000 orphans left in Upper Silesia as a result of a typhus epidemic. He visited many reform institutions in Germany and founded many philanthropic societies. In 1851 he was requested by the government to offer suggestions for prison reform. In 1857 he was appointed a member of the Higher Ecclesiastical Council. In 1866, and again 1870–1871, he was interested in organizing societies to care for the sick and wounded soldiers. In 1872 he returned to the direction of the *Rauhe Haus*, but only for one year. He died in 1881 at Hamburg.

See Rauhe Haus.

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WICKERSHAM, JAMES PYLE (1825–1891). — State superintendent of public instruction; born in Newlin Township, Chester Co., Pa., March 5, 1825. He was educated in the district schools and at the Unionville Academy. He taught in the district schools of Pennsylvania; was principal of the academy at Marietta; was superintendent of the schools of Lancaster county, and organized a training class for teachers which, in 1855, became the State Normal School at Millersville, Pa. He was principal of this school — the first in Pennsylvania — from 1855 to 1862. During the Civil War he raised a regiment of teachers from Lancaster county, which he commanded. He was state superintendent of public instruction of Pennsylvania from 1866 to 1881, and inaugurated a number of important reforms.

Mr. Wickersham was one of the organizers of the Pennsylvania Teachers' Association in 1852 and its president in 1865. He edited for ten years the Pennsylvania *School Journal*, to which he contributed many articles. His other publications include *School Economy* (1864) and *Methods of Instruction* (1865). The latter was translated into French, Spanish, and Japanese. His *History of Education in Pennsylvania* (Lancaster, 1886) is probably the best state history of education yet written. He died at Lancaster March 2, 1891.

W. S. M.

See Pennsylvania, State of.

WIDMAN, JOHANN. — A leading teacher of mathematics at the close of the fifteenth century. He was born at Eger, in Bohemia, *c.* 1460. He studied at Leipzig (1480–1486), devoting himself to mathematics and medicine.

He wrote on medicine (1497) and arithmetic. He may have been the first to lecture on algebra at Leipzig, since an old Dresden manuscript has this note: "Quare hodie hora secunda post sermonem atque Baccelaureorum celebrata disputatione Magister Jo. W. De Eg. Aporismata et Regulas Algobre resumpturus pro hora atque loco conuenienti cum audeturis concordabit." Widman probably wrote an *Algorithmus linealis* (c. 1488) and certainly wrote the *Behennd Vnd hüpsch Rechnung vff allen kauffmanschafften* (1489). The latter work went through five editions. D. E. S.

WILBERFORCE UNIVERSITY, WILBERFORCE, O. — A school for negro youth situated near Xenia, Ohio. It is the final outgrowth of the first organized effort in this country for the education of the race, begun near Columbus, Ohio, in 1847 by the African Methodist Episcopal Church. This effort was finally merged with the University in 1863, which has opened in 1856 under the M.E. Church. Dr. Richard Rust, late Secretary of the Freedman's Aid Society, was its first president. It comprises three schools: college, theological seminary, and a normal and industrial department supported by the state, with a military department supported by the United States government. It now has 350 acres of land, twenty-four buildings, brick and frame, including ten large halls, dormitories, and library, farmhouses, teachers' cottages, and power house. The plant is valued at $400,000. Over 9000 youth have received training here, and over 1000 have graduated. The institution has thirty-two teachers, a dozen tutors, and an average of 400 students drawn from all states and from abroad. It has built up an exceptional race community about it where the greatest inspiration is found to right living and success. W. S. S.

WILBUR, HARVEY BACHUS (1820–1863). — First principal of the New York School for Feeble-Minded Children; was graduated from Amherst College in 1838 and the Berkshire Medical Institution in 1842. Author of numerous papers on the education of feeble-minded children and *The Object System of Instruction as pursued in the Schools of Oswego* (*q.v.*). W. S. M.

WILDERSPIN, SAMUEL (c. 1792–1866). — English educator, born at Hornsey, not then absorbed into London. He speaks of spending much of his infancy "in the beautiful fields and wild copses" about his home and on the "solitary banks of the New River." "Unfortunately, through very peculiar circumstances" (which are not specified), he was "removed from the immediate care and superintendence of both parents rather early in life" and "left to grapple nearly alone" with the dangers of London "with little of either parental guidance." He "was destined for business, and served the usual apprenticeship to become qualified for it, and also continued in it for a short period on his "own account." "Even at this time the thought ever haunted" him "as to what should be done for young children. At length the germ was developed in one of the Sunday schools," where the pupils who "knew little or nothing" were committed to his care. Having made the acquaintance of James Buchanan (*q.v.*), he used to visit his school at Westminster. There he came under the notice of Joseph Wilson, by whom he was asked to take charge of a similar school (opened on July 24, 1820) in Quaker Street, Spitalfields.

Experience there soon led Wilderspin to make certain innovations. He used the playground not only as a place for recreation and physical exercises, but as a place of mental and moral training; he invented the gallery, which has not long disappeared, and the Arithmeticon, which still exists as the ball frame; but while he introduced some new methods, he did not discover any new principles; his infant school was in every essential respect a small copy of the school for older children. In 1823 he published his first book — *On the Importance of Educating the Infant Children of the Poor.* This probably helped to prepare the way for the institution in 1824 of the Infant School Society, and certainly helped to procure the author's engagement as its "agent." For some years he was employed "in different parts of the kingdom to open schools and to give practical instructions to the persons appointed to manage them," and after the dissolution of the society he continued his missionary journeys on his own account. In 1829 he visited Scotland at the invitation of David Stow (*q.v.*) and in 1839 he received a government appointment as master of the Central Model School in Dublin. In 1841 he resigned and returned to England. In 1846 he was granted a Civil List pension of £100 a year, and in 1847 he was presented with his portrait, painted by J. H. Herbert, R.A., Monckton Milnes (afterwards Lord Houghton), and Charles Dickens taking part in the ceremony. He died on March 10, 1866, and was buried at Thornes, a suburb of Wakefield.

Wilderspin developed the infant school and made it popular; and if he did not manifest any striking originality as an inventor, he rendered very valuable services as a missionary. Besides the work cited above (called in subsequent editions *Infant Education* and *The Infant System*) Wilderspin wrote *Early Discipline Illustrated* and (in collaboration with his son-in-law, T. J. Terrington) *A Manual for the Religious and Moral Instruction of Young Children in the Nursery and Infant School.* D. Sa.

See Infant Schools; Owen, Robert; also Monitorial Schools.

References: —

There is no adequate biography of Wilderspin. The facts of his life have to be gathered from incidental statements (generally indefinite) in his own works, Parliamentary *Reports*, old magazines, and the *Reminiscences* of Robert Owen. See also references under *Infant Schools*.

WILL, AND EDUCATION OF THE WILL. — Under the threefold classification of mental processes all tendencies toward action are distinguished from the process of knowledge on the one hand, and emotional experiences on the other. Thus, when one sees an object he may remain unmoved by it, or he may on the other hand be aroused to grasp it. In the latter case the grasping is regarded as distinct from the mere seeing of the object, and it is said that a volitional or conative state has been added to the mere process of recognition. The will of the individual is said to have been aroused as well as his intelligence. In the same fashion one may suffer and be displeased without resisting in any way a disagreeable experience, but one may be so aroused by the disagreeable experience that he will exert himself to shake off the cause. In the latter case the effort to remove the cause of the disagreeable experience draws into action a phase of human nature which is not emotional, but dynamic, in character. This dynamic phase of human nature is that to which we refer under the general term " will."

It has long been recognized that grave difficulties arise when any effort is made to distinguish between the dynamic phases of mental life and the other aspects of experience. Thus, the recognition of an object always involves some turning of the attention upon that object. Even on the physiological side there is a motor element connected with perception. The eyes must be turned in the direction of the object, and must be converged upon it, before any perception of the object is possible. In like manner, the emotions are very largely conditioned by the bodily processes which go on during an emotional state. The rapid beating of the heart, the contraction of the face muscles, contribute in a very large measure to the emotional experience. Many writers have been led by these difficulties of analysis to abandon the effort to distinguish between volition and the other aspects of mental life. Thus Wundt finds in all mental processes the general volitional characteristic which he emphasizes by describing his psychology as a system of voluntarism (*q.v.*).

There is a second motive for distinguishing the will from other aspects of life. Many of the movements of an individual take place without any deliberation and without any feeling of personal control. Thus when one winks the eye to protect that organ against an object that is moving rapidly toward it, there is no consciousness of any ability to choose between the movement which is executed and some other form of behavior. A movement of the eyelid under these circumstances is said to be without effort of the will. It is described as involuntary, and is sharply contrasted with that form of behavior in which an individual chooses after deliberation from two or more possible lines of action. Voluntary behavior is now defined as behavior which grows out of an experience of choice or an experience of personal control. Such behavior is undoubtedly of a higher type than movement which is not under individual control. In individual experience there is a growing emphasis upon control and choice. Thus, the young child moves in this direction or that impulsively, without any deliberation, and his movements are likely to be of short duration, indicating no complete plan of action. In the course of individual development there is a steady progress in the direction of a more consistent scheme of action, indicating the growth of certain tendencies which are supported by conscious choice, and by the framing of conscious plans.

In addition to these empirical facts which appear when one discusses the development of individual life, there are certain broad metaphysical questions which have always been taken up in discussions of the nature of the will. It has been held, on the one side, that the individual is capable from within of determining the course of his action. On the other hand, it has been held that the individual is determined in his own development and in his various acts by the conditions which surround him and which give rise to his momentary experience. The first of these two doctrines, in its extreme form, is known as the doctrine of libertarianism. According to this doctrine an individual may choose each time he acts which direction he will follow. If it were conceivable that exactly the same individual could be confronted two times in succession by exactly the same external possibilities, that individual might, according to the doctrine of libertarianism, move in the one case in one direction and in the second case in another direction. The doctrine of determinism, on the other hand, holds that the individual is completely determined in his choice by his past development and by the present conditions which surround him. The same individual, confronted by like circumstances, will, of necessity, according to this doctrine, always follow the same course of action. The dispute which grows out of these two extreme positions is of large pedagogical importance, as has been shown by Herbart. Herbart calls attention to the fact that a doctrine of absolute libertarianism would lead to pessimism with regard to the efficacy of education. If the individual's past development does not determine in any wise what his future conduct will be; if in each situation the individual's choice of lines of behavior is entirely capricious, then educational influences cannot hope to mold character. On the other hand, if the individual is absolutely determined by his inheritance and by the experiences that have come into his life, the effects of education in setting up rational principles of choice which are to be followed, will evidently be small or entirely negligible. The hope of education lies, therefore, in the recognition of the fact that an individual who has been trained to respond to his environment will retain the traces of this training and will in the future tend to follow the course of action into which he has developed through his education. There must, on the other hand, be a certain flexibility which is exhibited by the individual, such that his choice of action may be determined by the present emergency and his general interpretation of the situation in which he finds himself.

From another point of view, the education of the will has been emphasized as of great importance in the development of civilization and of human life. Thus Giddings, in his *Principles of Sociology*, calls attention to the fact that the characteristic difference between the civilized individual and the savage is to be found in the fact that the civilized individual is capable of self-control, whereas the savage always acts on momentary impulse. If the savage is confronted by a large supply of food, he will eat without choice or discrimination, whereas the civilized individual, looking forward into the future and seeing the probabilities of future needs, will restrain himself, and through his exhibition of self-control, give evidence of a much larger and more intelligent comprehension of the relations of his behavior than does the savage. Impulse as thus described by Giddings is not an involuntary tendency toward action, but it is a very simple and unintelligent reaction, whereas deliberate intelligent choice indicates the growth of a maturer form of behavior. In discussing racial development, McDougall, in his *Introduction to Social Psychology*, emphasizes the connection between volition and emotion, and points out the fact that the usual discussions to be found in the psychologies are defective for purposes of the study of social organization because these common studies treat only of the intellectual processes. Action, especially in social communities, depends, as McDougall points out, very largely upon emotional states. Fear and hunger are larger social factors than any intelligent theories of the way in which one should live. Consequently, we must recognize, according to McDougall's discussion, the essential relation between the development of the emotional life and the development of behavior.

Finally, an important discussion of the nature and development of volition appears in James's chapter on the will in his *Principles of Psychology*. James classifies the different types of decision and shows that there is a progress from simpler forms of primitive decision to the higher forms. He also calls attention to the intimate relation between the growth of knowledge and the growth of self-control. He finds it difficult to determine, however, in this discussion whether the final decision with regard to attention is to be sought in the will or in the intellectual processes. Ideas are chosen apparently by an inner force, which is more potent than the intellectual processes involved in forming these ideas. James comes to the conclusion that will must be recognized as a final and most significant element of human nature, capable of dominating in the last analysis even the intellectual and emotional processes. Such a conclusion as that of James is at variance with the common type of exposition to be found in the textbooks on psychology, where will is generally used as a broad term to include all phases of behavior, especially where that behavior includes choice and deliberation. It is usually treated as a concept under which certain conscious processes are to be classified, rather than as a determining force. C. H. J.

See MORAL EDUCATION; also HERBART; IMPULSE; MOTOR EDUCATION, etc.

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BALDWIN, J. M. *Dictionary of Philosophy and Psychology.* Vol. III, Pt. II, pp. 1185–1188. (New York, 1901–1905.)

See also the works referred to in the text, and general textbooks on psychology.

WILL, DISORDERS OF THE. — The disorders of will vary from those of inability, as, for example, aboulia (*q.v.*) and paralysis (*q.v.*) to those of retardation and inaccuracy. They are evidenced by indecisions or by lack of motor response. They are to be found in all types of abnormal people and in many who are not pathological. The exaggerated indecisions of the normal man are really disorders of will. Some individuals are unable to decide many things for themselves and they rely upon their comrades or upon their relatives; these lead to the exaggerated forms of aboulia, viz., the inability to make decisions or to carry out any line of conduct on one's own initiative. The latter condition is not uncommonly found in hysteria (*q.v.*) and is fairly common in many other disorders, frequently accompanying obsession (*q.v.*). All that can be done in the curable types of aboulia is to insist upon the selection by the individual of a definite mode of reaction regardless of its rightness or wrongness. Once the individual begins to react for himself, the actions may be controlled by the pointing out of the various possibilities of action and the control of this action through appropriate motives or conditions. Of special interest in an educational way are the disorders which are opposite those which have been mentioned. The disorders of will in the sense of willfulness are due to a lack of appreciation of consequences and to a lack of inhibition. The indecisions like those of the easy-going man or child, who is willing to let others suggest and carry out many things, are due to the lack of confidence the individual may have in himself, and perhaps to some extent to an increased suggestibility. S. I. F.

See WILL.

WILLAMETTE UNIVERSITY, SALEM, ORE. — A coeducational institution founded in 1834 as an Indian mission school. In 1844 it became a school for white children, and in 1853 the present university was established. In 1867 a school of medicine was organized and in 1884 a school of law. There are, in addition, the college of liberal arts, the academy, and schools of theology, art, and music. The requirements for entrance are fifteen units. The University confers the following degrees: A.B., A.M., B.D., M.D., D.D., and LL.D. Facilities are afforded for the training of teachers for elementary and secondary schools. The total enrollment in the college of liberal arts in 1911–1912 was 183 of a total of 420. The faculty consists of fifty-five members.

WILLARD, EMMA HART (1787–1870). — Leader in the American movement for the higher education of women, founder of the Troy Female Seminary, and active in the great national revival of common schools in the United States; was born at Berlin, Ct., the 23d of Feb., 1787. She was the sixteenth of a family of seventeen children, her sister, Mrs. Almira Lincoln Phelps (*q.v.*), also distinguished as an educator, being the seventeenth child. She received much of her early education from her father and mother, and later she attended the academy in her home town a few terms. At the age of sixteen she began her career as a teacher in the district schools of Connecticut.

She was principal of the Berlin Academy for a year; was assistant principal of the Westfield (Mass.) Academy for a year, and in 1807 she established a seminary for girls at Middlebury, Vt. As many of her students were from New York State, she was urged by Governor De Witt Clinton (*q.v.*), "the obstinate and intelligent friend of education," to remove her school to Waterford, N.Y. This was done in 1819. The institution was incorporated; and Governor Clinton urged the legislature to make an appropriation similar to that made to Union College; but the measure failed to pass the legislature. In 1820 the city of Troy came to the rescue and by taxation raised $4000; by private subscription another fund was raised, and the institution was removed to Troy in 1821 and named the Troy Female Seminary. This institution, as has been well said, "was the Vassar College of New York state a half century before the establishment of the institution at Poughkeepsie." Her seminary not only gave women collegiate education but it trained large numbers of women teachers.

Mrs. Willard was one of the foremost actors in the great national revival of common schools in America in the first half of the last century. She was entirely familiar with American conditions and needs, and "her eye was on the whole country. New England she knew could be left to make its own way; but the great new world opening beyond the Hudson was in need of educational missionary work." To this work she gave all the time that she could possibly spare from the seminary. During the years 1845–1847 she traveled 8000 miles by packet boat, stagecoach, and private carriage through the states of the South and West, agitating and counseling in the matter of public education.

She was active in the Western Literary Institute (*q.v.*) and other American educational associations, and in 1854 she and Henry Barnard represented the United States at the International Congress of Education (*q.v.*) held at London. Her publications were numerous, particularly in the matter of schoolbooks. Her works include *Plan for Improving Female Education* (1819), *History of the United States* (1828), *Universal History* (1837), *English History* (1845), *Ancient History* (1847), *Astronomy* (1853), and *Morals for the Young* (1857). She was joint author with William C. Woodbridge (*q.v.*) of a series of school geographies, and she and her sister Mrs. Almira Lincoln Phelps (*q.v.*) translated from the French Mme. Necker de Saussure's *Progressive Education*. W. S. M.

See WOMEN, EDUCATION OF.

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WILLARD, JOSEPH (1739–1804). — Twelfth president of Harvard College; graduated from Harvard in 1765. He engaged in the ministry until 1781, when he was chosen president of Harvard, which position he held until his death. "At the head of the university he mingled paternal tenderness with strict authority; and, by his dignified person and deportment, united with candor, generosity, and benevolence, he secured at the same time respect and affection." He was the author of several mathematical and scientific papers. W. S. M.

WILLARD, SAMUEL (1640–1707). — Seventh president of Harvard College. He was graduated from Harvard in 1659, and engaged in the ministry until 1701, when he succeeded Increase Mather as president of

Harvard. This position he held until his death. "His largest work, and the first folio volume on divinity printed in this country, was published in 1726, entitled *A Body of Divinity in Two hundred and fifty Expository Lectures on the Assembly's Shorter Catechism.*"
W. S. M.

WILLIAM AND MARY, THE COLLEGE OF, WILLIAMSBURG, VA. — The project for the establishment of a college in Virginia was first agitated in 1617 and was discussed at the Virginia Assembly in 1619. The Indian massacre led to the abandonment of the lands set aside for the College, and though the plan was revived from time to time the immediate project was not realized. In 1693, however, under the energetic leadership of Rev. James Blair (*q.v.*), a charter was secured directly from the sovereigns, William and Mary, issued under seal of the privy council. The following year it was granted a coat of arms by the College of Heralds in London, a unique distinction among American colleges. It held its first commencement in 1700. Rev. James Blair had in 1693 become the first president, and, in 1729, he with six professors and an usher and writing master formed the faculty, the first full college faculty in America. The main building was designed by Sir Christopher Wren, and though it has three times suffered from fire, its massive walls remain substantially unchanged. The president's house and the Brafferton building are types of the best colonial architecture. The former was injured by fire during the Yorktown campaign, after having served as General La Fayette's headquarters, but was restored at the expense of the French. Before the Revolution, the College was wealthy, possessing valuable property in England, especially the Brafferton estate, which had come to it through the executors of the philosopher, Robert Boyle (*q.v.*), and also receiving certain public revenues in the colony. This income was lost to it by the Revolution.

The college was reorganized under a new governing board, of which the most influential member was Thomas Jefferson (*q.v.*), a former student of the institution. James Madison, later Bishop Madison, became president, and under Jefferson's influence great changes were made in the curriculum and organization, and the innovations introduced were epoch-making in their influence upon education. Chairs of modern languages, municipal law, political economy, and history, the first of the kind in America, were introduced, and the study of Latin and Greek was for a time discontinued, though privately continued for the benefit of the students by one of the professors. In a few years the study was put on a college footing. The college was intimately associated with the political and social life of Virginia, especially while Williamsburg remained the capital of the State. After the Revolution, it continued its work under depressing influences, reaching a specially successful period under President Thomas R. Dew from 1836–1846, until in 1861 it closed, to reopen at the end of the war, 1865, under its president, Colonel Benjamin S. Ewell. For lack of finances it was closed from 1881 until 1888, but reopened in the latter year by aid of a state appropriation, with Lyon G. Tyler as president. Since 1906 it has been wholly a state institution under state officers. Its governing board is appointed by the Governor of Virginia, and the corporation retains its historic name of the "College of William and Mary in Virginia."

The College never had any great numbers of students, but is conspicuous for its contribution to the development of higher education in America; its most notable contribution being the honor system, the elective system of studies, and the Phi Beta Kappa society. The latter, with the exception of the extinct Flat Hat Club which preceded it at William and Mary, was the earliest of American Greek letter or intercollegiate societies and was founded on Dec. 5, 1776. (See FRATERNITIES.) The date of the beginnings of the honor and elective systems is 1779. Lord Botetourt in 1771 instituted the first college prizes by establishing the famous Botetourt medals. Of its noteworthy influences upon American education not the least have been through institutions like the Massachusetts Institute of Technology and the University of Virginia established by its alumni, and the part taken by its recent graduates in the past ten years of educational regeneration in Virginia. No American college, however great its numbers, has been more distinguished through its alumni. Washington, Chancellor of the College after the Revolution, received from it his surveyor's license. Its alumni list includes Presidents Jefferson, Monroe, and Tyler; of the United States Supreme Court, Chief Justices John Marshall, John Blair, Bushrod Washington, and Philip P. Barbour; of the United States Army, General Winfield Scott; of the United States Senate, John Randolph, the Tazewells, Robert Carter Nicholas, James M. Mason, and numerous others; speakers of the House, a great number of members of the House and of ministers of England and France; in colonial days the majority of the Committee of Correspondence and Safety for Virginia; four of the seven Virginia signers of the Declaration of Independence, Wythe, Harrison, Braxton, and its author Jefferson; fifteen of the members of the Continental Congress from Virginia, including its first president, Peyton Randolph, Benjamin Harrison, Richard and Theodoric Bland, and Edmund Randolph. Should governors of state and men of equal distinction be mentioned, the roll would be astounding.

The College had a law school from 1779 to 1861, which was the first college law school in the United States. Chancellor George Wythe was the first law professor, being the first in the United States and the second in the English-speaking world, next in time to Sir William Blackstone at Oxford. Since 1865, the college work has been purely academic. Full entrance into the college requires fourteen units; a student may be conditioned on two units. The college confers in course the degrees of A.B., B.S., and A.M. Since 1888 the college has maintained a normal department in connection with which there are operated a practice school and an academy. The college is supported by appropriation from the State and income from endowment. It has an endowment fund of $151,327.50 and property valued at $261,000. The staff of instructors consists of twenty-three, of whom twelve are full professors. The enrollment of students for 1910–1911 was 224. L. G. T.

See French Influence in American Education; Jefferson, Thomas; Virginia, Education in; College, American.

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WILLIAM JEWELL COLLEGE, LIBERTY, MO. — Was founded in 1849 by the Baptist denomination of the state, under whose authority it yet remains. The College was named after Dr. William Jewell, a physician, to whose active interest and philanthropy was due its founding. Besides the College of Liberal Arts, recognized as one of the leading denominational colleges of the Middle West, a school of theology is also maintained, with an annual attendance of about 250. The attendance on the college in 1911–1912 was 245, with a larger number in the subfreshman department. The teaching staff of the college numbers twenty-four.

WILLIAM OF CHAMPEAUX. — See Champeaux, William of.

WILLIAM OF OCCAM. — See Scholasticism; Schoolmen.

WILLIAM SMITH COLLEGE. — See Hobart College, Geneva, N.Y.

WILLIAMS COLLEGE, WILLIAMSTOWN, MASS. — Founded by Colonel Ephraim Williams who, seven weeks before his death in an ambuscade at Lake George, executed his will at Albany on July 22, 1755, in which he made provision for the establishment of a "Free School," at Williamstown. This academy was opened in the autumn of 1791. It had been in operation only six months when the trustees sent a petition to the legislature asking for a college charter, which was granted on July 22, 1793. In the following October the new institution began with an equipment of one building, with a meager library, with funds to the amount of $8800, with approximately twenty-five students and a faculty of two members. The principal of the academy, Ebenezer Fitch, a Yale graduate, became president, and Noah Linsly, another Yale alumnus, instructor. As both members of the faculty and seven of the twelve trustees were Yale graduates it was natural that New Haven precedents should be followed in by-laws, curriculum, and terms of admission. One surprising innovation, however, appeared in the entrance requirements — French might be substituted for Greek.

During the administration of Dr. Fitch, 1793–1815, a second dormitory and a president's house were added to the campus, four professorships established — law and civil polity in 1794; French in 1795; mathematics and natural philosophy in 1806; ancient languages in 1815; and 669 students enrolled, 449 of whom graduated. Among the 220 who did not graduate was William Cullen Bryant.

The six years, 1815–1821, of the second administration, that of Zephaniah Moore, a graduate of Dartmouth, were filled with the din of a contest to remove the college to Northampton. The question was carried to the legislature, where, after a struggle which attracted the attention of the whole state, permission for removal was refused. Dr. Moore thereupon accepted a call to the presidency of the Charity Institution at Amherst. The only noteworthy academic events in this stormy period were the epoch-making lectures of Amos Eaton on natural philosophy in 1817, and just at the close of it the formation of an alumni association — the earliest in the country.

The college survived this first great crisis in a damaged condition and was poorly prepared for a second, which followed quickly. It arose from the application in 1823 of the Amherst Charity Institution for a college charter, which was secured in 1825. The opinion prevailed everywhere that Western Massachusetts could not support two colleges, and that, if the experiment were tried, it would inevitably prove fatal to Williams. It did not prove fatal because Edward Dorr Griffin succeeded Dr. Moore in the presidency. Widely known and at his best perhaps the most impressive pulpit orator of the period, his prestige and eloquence and energy saved the day. Raising $25,000 he endowed with it a chair of philosophy and built Griffin Hall, events which assured the public that the college "could live and flourish on this ground." The third administration, 1821–1836, was also distinguished by certain new departures in the

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Williams College.

academic world — the organization of a Natural History Society (probably) in 1825, of an Antislavery Society in 1826, of an anti-secret fraternity in 1834, and of a scientific expedition to Labrador in 1835.

During the administration of Mark Hopkins, 1836–1872, the first of a Williams graduate, there was substantial progress in buildings, endowment, teaching staff, and reputation. The astronomical observatory of 1838, which is still in service, antedated all similar structures in this country with a single and temporary exception. (See ASTRONOMY.) Scientific expeditions were undertaken in 1855, 1857, and 1860. No exceptional innovations disturbed the curriculum which followed current lines of progress. The average number of graduates rose to forty-one, while in the third administration it was twenty-one; in the second fifteen; and in the first twenty-two. The paramount feature in the history of the fourth administration is the rise of Mark Hopkins (*q.v.*), as one of the two or three great teachers of the last century. Among the many distinguished graduates of this period was James Abraham Garfield (*q.v.*), twentieth president of the United States.

The later administrations are those of Paul Ansel Chadbourne, 1872–1881; Franklin Carter, 1881–1901; John Haskell Hewett (Acting President), 1901–1902; Henry Hopkins, 1902–1908; Harry Augustus Garfield, 1908–. During this interval great changes have been made, especially in the physical plant of the institution. From June 1, 1904, to June 1, 1912, including the chapel, Clark Hall and Grace Hall, $1,339,431.51 were expended upon the campus. The old required course of studies continued until 1881, when elective studies embracing about 40 per cent of the work were introduced into the senior class. In 1886 similar options were extended to the junior class. Ultimately 80 per cent of the work of these classes became elective, and a limited number of options were permitted in the sophomore year. In 1911 the faculty adopted a radical group system, which aimed to secure "concentration of part of the student's work in one well-defined field and the distribution of another part among different subjects." There are five admission groups, varying from fourteen to fifteen units and all leading to the degree of A.B. Certificates for admission are accepted, with certain reservations.

The value of the college equipment — lands, buildings, and apparatus — July 1, 1912, was $1,840,128.17, the invested funds were $1,420,589.16, and the library contained 72,400 volumes. For the college year 1911–1912 the faculty numbered fifty-one and there were 533 students. Of the latter 329 belong to the thirteen Greek letter fraternities. All these fraternities own chapter-houses which are assessed for $356,012. The income of the college for the fiscal year ending March 31, 1912, was $189,545.73. L. W. S.

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WILLIAMS, ELISHA (1695–1755). — Fifth president of Yale College; graduated from Harvard in 1711. He engaged in the ministry and was president of Yale from 1725 to 1739. One of his biographers says "he presided at commencements with great dignity." He was chaplain in the expedition against Cape Breton. He published several religious works. W. S. M.

WILMINGTON COLLEGE, WILMINGTON, OHIO. — A coeducational institution founded in 1870 and chartered in 1875. It is under the auspices of the Wilmington Yearly Meeting of Friends. A preparatory school is maintained in addition to the college. The entrance requirements are based on the work of a complete high school. The degrees of B.A. and B.S. are conferred. The enrollment of collegiate students in 1910–1911 was ninety. The faculty consists of sixteen members.

WILSON COLLEGE, CHAMBERSBURG, PA. — A college for women chartered by the state of Pennsylvania, 1869, and opened in October, 1870. The first $30,000 of its funds were given by Miss Sarah Wilson, a resident of the county. Others, both men and women, gave money and labor, the members of the Presbytery of Carlisle, within the bounds of which the College is situated, being especially active in the new enterprise. When the College was incorporated, the Presbytery, believing that the College would progress more rapidly if it should have its own board of trustees, handed over the institution to such a board. According to the first catalogue issued, the college was "designed to extend to young ladies the same high advantage for a thorough education — physical, intellectual, moral, and religious — as are now afforded to young men in the best colleges in the land."

The entrance requirements are fourteen and a half units. The course of study for the degree of A.B. extends through four years. The requirement for graduation is the completion of 120 hours' work, one hour being a course having one class appointment per week for a semester. The list of presidents of Wilson College since 1883 is as follows: Rev. John Edgar, A.M. (1883–1894); Rev. Samuel Martin, D.D. (1895–1903); Matthew Howell Reaser, Ph.D. (1903–1912); Anna Jane McKeag, Ph.D., LL.D. (1912–). The faculty at present consists of twenty-nine members and the student enrollment in 1911–1912 was about 256. A. J. M.

WILSON, THOMAS (c. 1525–1581). — English statesman and author, educated at Eton and King's College, Cambridge, where he graduated in 1545–1546. He was the author of the *Rule of Reason, conteinynge the Arts of Logique set forth in Englische* (1551) and an *Arte of Rhetorique for the use of all suche as are studious of Eloquence, sette forth in Englishe by Thomas Wilson* (the earliest known edition is dated 1553), in which the rules of rhetoric are taken from Aristotle, Cicero, and Quintilian. As an opponent of the " strange inkhorn terms" and the use of French and Italianated idiom, Wilson may through this work have contributed to the development of purity of the English. Wilson was ambassador to Portugal and the Netherlands, member of Parliament, and in the last few years of his life secretary of state.

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WIMPHELING, JACOB (1450–1528). — Early German humanist, born at Schlettstadt and educated at the Latin school of which Dringenberg (*q.v.*) was headmaster. He attended the University of Freiburg (1464–1468) and, after a brief stay at Erfurt, he entered the University of Heidelberg, where he studied philosophy and became *magister* in 1470. For a brief period he studied canon law, which proving distasteful to him, he devoted himself to theology. But his chief interest was in the new learning and as Rector of the University in 1481–1482 he strove to raise the standard of scholarship among the students. Not only was he bitterly opposed to the vain and empty methods of scholasticism, but he also undertook the task of attacking the abuses and excesses of the clergy and monks of his day. At the age of twenty he had already written the *Stylpho*, probably the first Latin comedy of the humanistic period in Germany. This was an attack on the idlers who neglected study and looked for preferment by favor, and was a strong plea for the study of the humanities of the clergy. From 1484 to 1498 he was cathedral preacher at Speyer, but, although he played an important part in the ecclesiastical affairs of his day, he was anxious to return to the scholarly life of the university. In 1498 he was appointed to the chair of poetry at the University of Heidelberg which had recently been reformed in the direction of humanistic studies. Here he probably became a member of the Rhenish literary society which had been founded in 1495 by Conrad Celtes and of which his friends Celtes, Dalberg, and Trithemius were members. But his stay in Heidelberg was of short duration, and he retired in 1501 to Strassburg and later in 1515 to Schlettstadt, in both of which towns he organized literary circles on the model of that of Celtes.

Wimpheling was a voluminous writer in the fields of theology, education, and history. Enthusiastically devoted to the cause of education, he never ceased advocating its value for the clergy, the statesman, the warrior, the citizen. His contributions were, however, not confined to theory alone; he was the author of several textbooks based on the new methods required by the new education. The *Isidoneus Germanicus* (1497) is a handbook for teachers of Latin which can be read with profit even in modern times. After criticizing the defective methods of his day, the poor teaching, the carelessness of parents in selecting schools and teachers, he condemns in detail the scholastic devotion to grammar, but retains the prevailing textbooks of Donatus and Alexander. He emphasizes the learning of grammar by use in speech and writing and the example of good authors. Only enough grammar should be taught to enable a pupil to read and speak Latin with ease and grace. The reading matter should be carefully selected not only from the classics but also the medieval authors such as Jerome, Lactantius, Prudentius, etc. The school should train not only the intellect but the will, and with the church fathers' teaching Wimpheling believed in the value of the classics. But much depends on the personality of the teacher and attention to the individuality of the pupil. Like all reformers, Wimpheling was an advocate of mild discipline and the avoidance of corporal punishment. The importance of the *Isidoneus* may be measured by the fact that it went through three editions in three months. The *Elegantiarum medulla oratoriaque præcepta* (1493) and the *Elegantiæ majores* (1499) were handbooks of style and rhetoric containing extracts from ancient and medieval authors. While the *Isidoneus* dealt in the main with methods of instruction, the *Adolescentia* (1499) is a treatise on the theory of education in the past. The first part emphasizes the need of a good moral training for the young rather than logic and dialectic, and the preparation of men to serve the church and state. The school, the church, and the family must coöperate in the work, and the teacher must have a good understanding of the psychological nature of his pupils, for whom only the best is good enough. The second part of the work consists of extracts in prose and verse from authors of all ages, both sacred and profane. This was meant for the use of the pupils and contained numerous proverbs and precepts on all activities of life. The work went through seven editions up to 1515. In the *Agatharchia* (*The Good Prince*, 1495) and in the *Germania ad rem publicam Argentinensem* (*An Address to the Town Council of Strassburg*), Wimpheling impresses on the ruling powers in each case the importance of maintaining educational institutions and looking after the welfare, spiritual and moral, of the citizens. The latter work may in its general tenor, so far as it deals with education, be compared with Luther's *Address to the Mayors and Councillors*, etc. (1524). If Wimpheling may be regarded as one of the leaders in the early humanistic movement in Germany, he also deserves the title of the "father of German history," for the *Epitom Germanicarum rerum* (1505) is the first connected history of Germany. He attached great value to the study of history for practical and ethical purposes, and in his work he holds up the ideals of the German nation, its great leaders, and its social life and civilization, of which he also gives a picture in his own times in *De Arte impressoria* (*On the art of printing*, 1507).

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WINCHELL, ALEXANDER (1824–1891). — Geologist and author of textbooks; graduated from Wesleyan University in 1847. He was teacher in Massachusetts, New Jersey, and Alabama; professor in the University of Michigan (1853–1873 and 1879–1891) and in Syracuse University (1873–1878). His publications include *Theological Geology* (1857), *Modern University* (1873), *Comparative Geology* (1883), *Geological Excursions* (1884), and *Geological Studies* (1886). W. S. M.

WINCHESTER COLLEGE. — The first and oldest of the seven "Great Public Schools" of England. The "grammar school of the College of the Blessed Mary of Winchestre by Winchestre," the proper title of the school, dates from 1382, and was preceded by a grammar school of immemorial antiquity. At Winchester as elsewhere the foundation of the school must be traced to the foundation of the church in the year 648. The first reference to a school at Winchester is probably found in the pseudo-Asser's *Life of Alfred the Great*, written about the year 1001, in which the king is said to have sent (*c.* 893) his youngest son Ethelward to the grammar school (*ludis litterariæ disciplinæ*), presumably in the old West Saxon capital recently recovered from the Danes, in contrast to the two older children who were educated at court. At the school "before they had strength for manly arts, such as hunting and other gentlemanly sports, they were noted as scholars and proficient in the liberal arts." More certain evidence occurs in Ælfric's (*q.v.*) *English-Latin Grammar*, written in 995, in which he says he learnt Latin in "the school of Ethelwold, the venerable prelate, who taught many for their good." This was Ethelwold, Bishop of Winchester. In 1165 John of Salisbury referred to the Pope an appeal from the bishop as to the monopoly of the right to keep a Grammar School there. When Henry of Blois, the bishop concerned in the case, founded St. Cross Hospital, he provided besides the In-Brethren for 100 poor dining daily there; among these were thirteen poor scholars of the Grammar School sent by the master of the High School of the city. (See HOSPITAL SCHOOLS.) On April 13, 1205, King John directed the sheriff by writ to send the bearer, Geoffrey, to school at Winchester and find him in necessaries, sending the bill to the king. In 1295 it was directed by a bishop's order that the carrying of holy water and the perquisites attached to this were to be allowed only to the scholars in parishes near the school in Winchester and in other fortified towns of the diocese. This ordinance was reënforced by William of Wykeham in 1369. It was this school probably that Wykeham attended when he was sent (somewhere about 1330) "to school at Winchester" and there learned "the primitive sciences, grammar, logic, and philosophy." Whether he had this ancient school and its rights assigned to him for incorporation when he founded his college, as Colet (*q.v.*) did at St. Paul's in 1510 and Wolsey (*q.v.*) at Ipswich in 1527, is not known.

Wykeham was probably already maintaining a school at Winchester when he began in 1369 buying land at Oxford for his college there; and on September 1, 1373, contracted with Master Richard of Herton, grammarian, that he would for ten years teach and instruct in the art of grammar "the poor scholars whom Wykeham maintained and will maintain at his own cost." As Wykeham undertook to provide Herton with an assistant master, it is probable that the number was already 70, as was that of the scholars at Oxford in 1376 when Wykeham was deprived of his episcopal revenues and had to dismiss the scholars to their homes. A papal bull in 1378, enabling Wykeham to appropriate a church to the support of "a college he proposed to establish for 70 poor scholars who should live collegewise and study grammaticals near the city of Winchester," states that he had already for many (*pluribus*) years been ministering the necessaries of life to such scholars. The college was definitely founded and its site conveyed to the warden and scholars' clerks in 1382. A letter of Wykeham's, written in April, 1388, directed the election of the best scholars from Winchester to his college at Oxford, called New College, without partiality, and objected to discussions as to the nobility or want of nobility of the birth of the scholars. While there was no novelty in attaching a school to a college (which had already been done at Merton and Queen's, and in the greatest college at Paris University (*q.v.*), the Royal College of Navarre, founded in 1304) and it was the custom and law for collegiate churches to maintain schools, the establishment of a school as a separate and distinct college, and in another place, though bound by close ties to the superior college, was a new departure of prime importance in the development of the English Public School System.

At the end of a statute headed "Of not introducing strangers at the charge of the college," which limits the visit of parents or other relatives of the scholars or fellows to two days, was added a clause: "We allow, however, that sons of noble or powerful persons, special friends of the said College to the number of ten, may be admitted into the said College to be instructed in and taught grammar without charge to the College; so long as thereby no prejudice, loss or scandal attaches to the College or any member of it." It is the growth of those ten commoners, *commensales*, or "tablers" sharing the table of the scholars in hall, into a preponderating majority which converted Winchester and its imitators, Eton and Westminster, and later Harrow and Rugby, into the "Great Public Schools" of to-day. In 1412 Cardinal Beaufort, Bishop of Winchester, was informed that the master "continually instructs and teaches grammar to 80 or 100 strangers" beyond the statutory ten. Though it was provided that the scholars should be "poor and needy" (*pauperes et indigentes*), yet we find that of the earliest commoners who were sons of "noblemen," *i.e.* in English usage, gentlemen, no less than half were in the two years following admitted as scholars. This shows that by "poor and needy" was not meant, as has often been alleged, the gutter poor, or even the laboring classes, who were then villeins and not eligible to clerkship or scholarship. The scholars were to be, first and preferentially, of the kin and family of Wykeham himself — in which respect Wykeham was following Merton's statutes for Merton College; next "poor and indigent boys thoroughly adorned with good character and birth (*bonis moribus et condicionibus perornati*) fit for school (*ad studium apti*), of gentlemanly behavior (*conversacione honesti*), competently learned in reading, plain song, and old Donat," *i.e.* who had not only had an elementary education in a song or reading school, but had also learned the elements of grammar. They were to be between eight and twelve years old, but admissible up to sixteen, if sufficiently advanced to be perfect in grammar and able to go on to New College at eighteen. The old grammar school seems to have been kept on as a day school of a lower grade, sending clever boys to the college. The latest evidence of its after-continuance is an appointment confirmed by Bishop Courtney in 1488 of a master of the "High Scole." The relations between the two schools were friendly; for there was no great rivalry between the two, the college drawing scholars from a larger area; first, any places in which the two colleges had property, next from the diocese of Winchester, *i.e.* from Hampshire and Surrey, then from eleven other counties in the south and west, and lastly from any other part of England. As a matter of fact the school was from the first national. The test of poverty laid down for the scholars was a high one. They were to swear that they had nothing which would enable them to spend more than 5 marks (£3 6*s.* 8*d.*) a year, equivalent to at least £100 now. Of livings in the diocese of Winchester no less than sixty-seven were below that value, and many of them only worth £4 or £2 a year. The poverty, therefore, was a relative one, and in Wykeham's own lifetime we find him nominating as scholars scions of county families and high officials. The scholars filled the highest places in Church and State. The first Headmaster after the new buildings were in use, Thomas of Romsey, had been master of the cathedral grammar school at Chichester. The second, who came in 1407, John Pole, was an old Wykehamist. His successor in 1418, Richard Darcey, had been second master of Gloucester Grammar School, and as such, one of the heroes of a famous lawsuit as to the licensing of schoolmasters in 1410. With the possible exception of him and of William Wayneflete (*q.v.*) for nearly five centuries, to the year 1901, no one who was not a scholar of Winchester, and, with two exceptions, of New College, was ever Headmaster.

The year 1530 is the first in which we get any attempt at a curriculum, or statement of what was actually taught in the school. William of Wykeham, like Joan of Navarre and other founders of schools, had directed only that the boys were to be taught "grammaticals" or "the art of grammar," without attempting to define what grammaticals were or in what the art consisted. In 1517, however, John Leche, vicar of Saffron Walden, Essex, and perhaps the John Leche who had been admitted scholar of Winchester in 1445, gave to the gild there land to the intent that the gild priest "shalbe a profound grammarion to teche gramer after the fourme of the scole of Wynchester or of Eton." So, when some years later the school was established, the authorities secured from the masters of those schools their "Form" or "Use" which was copied into the "Mayor's Book." The first page of the Winchester return is lost. It now begins in the middle of a sentence which shows that the school was divided into seven forms, the seventh being the highest. Of the sixth form we learn that on Thursday it read Ovid's *Metamorphoses* and on Friday Sallust with the seventh; and like as the seventh on Saturday and Sunday. The grammar in use was then a quite modern one, being that of Sulpicius, a schoolmaster of Rome from 1487 to 1506. Every day began with giving out of grammar rules, by one of the higher forms to the form below. Whether Forms VII and VI did any Greek we do not know, but as the Eton "order" is complete and contains no mention of Greek, it may be presumed that Winchester did not do any either, though from Horman's *Vulgaria* (*q.v.*) of 1519 it might be presumed that they did attempt some then. Form V learned Sallust by heart four days a week and four verses of Ovid on Thursday. They translated Vergil's *Eclogues* every day but Friday and Saturday. Friday was devoted to Cicero's *Letters* and Saturday to Repetition. They composed Latin from a theme set on one day, Latin verse on another, and a Latin letter on a third. The fourth form read Terence instead of Vergil. The third and second read Æsop's *Fables*, and the third also Lucian's *Dialogues* in Latin, the second the pseudo-Cato's *Moral Distichs*. Curiously enough even Sunday was not sacred from translating English epistles into Latin or Cicero's *Paradoxes* or Æsop's *Fables* into English. The third form had indeed on Sunday to say a dialogue of Lucian's "without booke" and to construe it. The school hours were from 6 A.M. to breakfast at 9, from 9.15 to 11 A.M., when there was dinner, and from 1 to 5 P.M. when there was supper. The education was very far from consisting only in learning Latin grammar rules, as is sometimes supposed. Composition, whether in verse or prose and considerably more in prose than verse, occupied a large part of the time, and reading Latin authors a larger part. The stress still laid on Latin as a spoken tongue may be seen from the importance attached to Terence. *The Flowers of Terence* by Nicholas Udal (*q.v.*) was the first book which brought him into notice and led to his being appointed master at Eton.

It is a moot point whether Winchester was doomed to destruction by Henry VIII. He showed it and Eton considerable favor in exempting them, with the colleges of Oxford and Cambridge, from the newly imposed Tenths, levied in lieu of papal dues, lest "the same should percaas discorage mannye of his subjectes whiche be both apte and wyllyng to apply themselves to larnyng." In return the Warden was to maintain two masses on 8 May and 8 October for the King, Queen Anne Boleyn, and the Princess Elizabeth. On the whole the college profited very decidedly by the dissolution of monasteries, though at one time it ran the risk of dissolution itself under the Chantries Act of Henry VIII. It acquired St. Elizabeth's College, founded by a former bishop and standing next door to St. Mary's, and at first covenanted to make it into the college school, to replace that built by Wykeham, now called Seventh Chamber, which was already too small for the enlarged numbers. But unfortunately they changed their minds and pulled it down. They enlarged the borders of Meads, the playing field, by purchase of the site of the Carmelite Friary on the south, while the Sustern or Sisters' Hospital, attached to the Cathedral Priory, on the west side, became a series of boarding houses and was eventually converted into "Commoners' College" as the Headmaster's boarding house.

From the new Chantries Act of Edward VI in 1547, Winchester and Eton, as colleges of the universities, were exempt, and so remained the sole survivors, apart from the cathedral grammar schools of Henry VIII's foundation, of the grammar schools attached to the collegiate churches spread over the land. Like the universities Winchester was visited by a Reforming Commission of Edward VI. Beyond directing that the Bible reading in Hall should be in English and that *Stella cæli* and *Salve Regina* or "such-like untrue and superstitious anthems" to the Virgin, patroness of the college, should be omitted, little change was made. One injunction directing that there should be no "excess correction but that the same may be mitigated by the Warden's correction" must have pleased the boys. In 1552, Edward VI in person visited the college, and the copies of verse presented to him show a very high standard in Latin, many of them indicate a knowledge of Greek, but there was only one copy of actual Greek verse among the forty three.

When the reaction came under Mary, Winchester was chiefly on the reactionary side and played no small part in it. But there were not wanting eminent Protestants also. Queen Elizabeth was, unfortunately for Winchester, defeated in an attempt to assert her right to appoint the Wardenship on his promotion to a crown appointment — much to the detriment of the school in later years, when the successful assertion of the right in the case of Eton gave the latter that outside impetus to reform which Winchester missed.

In 1630 a curious quarrel between the second master and the Headmaster ended in the former setting up a rival school in St. John's Hospital in the town, and taking a large number of the boys in the lower forms, mostly if not all day boys, with him. The archbishop of Canterbury was invoked to assert the monopoly of the college school and he revoked the second master's license to teach. But at the instance of the city the school was eventually allowed. From this time dates, it is believed, the refusal of the school to admit day boys or town boys, and the consequent shedding of the three lower forms. So that from this time the lowest form in the school was the fourth; and as the seventh disappeared also, the most intricate varieties of junior and senior divisions, of junior, middle, and senior parts of the fifth form, became necessary in later days, when the school was bigger, to describe the various classes.

The period of the Civil War and the Commonwealth proved to be palmy days for Winchester. The Warden, Harris, was a judicious

Parliamentarian and preserved his place, while the Provost of Eton and the Dean of Winchester lost theirs. In fact, except for a few Romanists, most Wykehamists were Parliamentarians. The college was never in danger from the Parliamentary army, as alleged in an eighteenth century legend of its salvation by a Parliamentary officer who was an old Wykehamist.

From the Commonwealth dates the first extant school list of the college. The register of the scholars is complete from 1394. Many early commoners are recorded in Hall books up to 1530. But from that time no names or numbers of commoners have been preserved before 1653. They then numbered only twenty-six, seven in college, the statutory "commensals," and nineteen out of college, two of whom are noted as being commensals, meaning probably that they dined in Hall. The rest were boarded as well as lodged outside college, probably in houses in the Sustern Spital. Counting the choristers who at this time were practically probationary scholars, the whole school was not more than 112, only about a third of the number at Westminster (*q.v.*) at the same period. A poem in Latin hexameters, *De Collegiata Schola Wiccamica Wintoniensi*, written by a boy in the school (*c.* 1646), gives the most complete picture of school life at this time which has come down to us. The school day from the Prefect calling *Surgite* at 5 A.M. to bedtime after chapel at 8, is so like the day at Eton in 1530, and at Westminster as ordered in its statutes of 1560, and like that of Winchester itself as shown in school histories down to the middle of the nineteenth century, as to make us think that it was little altered from the time of Wykeham. They still got up at 5 A.M. and did not get breakfast till 9. The only difference seems to be that dinner at 11 A.M. in 1530 was in 1646 at 12. Friday was still the day on which the crimes of the week were expiated by a "bibling" or flogging with the rod of four long apple twigs, instead of the Westminster birch.

The Restoration was a golden age for Winchester. Charles II's fondness for Winchester, where he began a great palace, never finished, and now used as barracks, brought an accession of commoners from the gilded youth, while many others attained eminence in the political history of the day. The increase of the commoners in numbers to over 70, making the total 166, produced a new school building in 1689, now used chiefly as a concert room, a fine structure often, but wrongly, attributed to Christopher Wren. The ultra-Toryism of the school under the first King George produced a heavy fall in the numbers to 20. But under Dr. Burton in 1724 the school rose again, and commoners soon exceeded 100, drawn from the most aristocratic families. The ten "commensals" were all lords, and in 1737 included the heirs of three dukedoms. In 1734 commoners numbered 123, making a school of 204 boys, a number beyond which it was never allowed to go for a whole century. The reason was that the Sustern Spital, converted into a single boarding house by Dr. Burton, from which it derived the name of Commoners' College, would not hold any more, while the Winchester authorities would not any longer permit the Westminster and Eton system of houses kept by persons who were not masters. Serious internal quarrels having arisen between master and second master in 1739, an extraordinary decadence took place, till in 1750 there were only ten commoners left. In 1766 Dr. Burton who had stayed as headmaster till he was seventy-four, or some fifteen years too long, retired. His successor, Joseph Warton, restored the fallen fame of the school and it became a nursery of English poets like Collins and Young. But he also stayed to too great an age. From 1775 to 1793 discipline was relaxed; the school arrangements needed reform and did not get it. Rebellions were frequent, culminating in one about attending a fashionable promenade at a military band playing in the Cathedral close, in which the college was held for two days by the boys under the red flag of liberty. It ended in wholesale expulsions, including nearly half the scholars, and commoners were reduced to one third of their proper numbers. Dr. Goddard, chiefly famous for having taught Dr. Arnold (*q.v.*) (who has had exaggerated fame for it) the proper way of governing boys, quickly restored the school to its normal 200. The old suspicious attitude of Goddard's successor, Gabell, toward boys again provoked rebellion in 1818, put down this time with gross treachery by two companies of soldiers with fixed bayonets. With few exceptions the scholars of this age, admitted without competition and going on almost without competition to fellowships at New College, where they found only a limited number of their old schoolfellows, and enjoyed the unfortunate privilege of exemption from examination in the schools, did little.

"Commoners" was rebuilt on a great scale in 1838, but a fatal outbreak of scarlet fever in 1846, owing to the neglect of sanitary conditions in the rebuilding, caused a rapid decline, and in 1856 the number of commoners fell even below that of the scholars. The University Commission of 1854 by restoring competition for scholarships at Winchester and fellowships at New College; the Public Schools Commission of 1862 by abolishing the sinecure fellows, who took all improvement of the college revenues to themselves instead of spending it on the school; the lesson learned of the unwisdom of putting all the eggs into one basket, packing all commoners into one huge house of 130 — turned the tide. The introduction of separate small masters' houses of under 40 boys by George Moberly (*q.v.*), in 1861 carried further by George Ridding (*q.v.*) who in 1868 converted the headmaster's house into classrooms and established six new houses in their place, quite restored the school. The 150 of 1856 had doubled itself by 1866, and rose to 420 by 1876. For some reason the number was kept down to 420 for 40 years. Under Dr. Burge, now Bishop of Southwark, a slight addition was made. The school now numbers 448, of whom 70 scholars are in the old college, and the rest in 10 houses of 38 each. A new house in Kingsgate Path was opened in September, 1912. The headmaster, Mr. M. T. Rendall, elected in June, 1911, is an old Harrovian, and there are 36 assistant masters. Boys are admitted between the ages of 12 and 15. The basis of the curriculum is classical, to which are added mathematics, one modern language, and either chemistry, geology, or physics. There is also an army class which gives special preparation for the examination for entrance into the army. The latest addition to the school buildings is a carpenter's shop, and carpentry and singing are now added to the curriculum of the lower forms. The oldest of the "Great Public Schools" is now in the quality of its provision for housing and teaching, in the quality of its output in learning, from the original science of grammar and classical scholarship, in which it has always stood preëminent, to the latest development of modern science and mathematics, and in its achievement in the much-cultivated fields of athletic life, if not *facile princeps*, yet *nulli secundus* of the schools of England. A. F. L.

See PUBLIC SCHOOLS; WYKEHAM, WILLIAM; also GRAMMAR SCHOOLS.

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WINDOWS OF THE SCHOOLROOM. — See LIGHTING OF SCHOOLROOM.

WINDWARD ISLANDS. — See WEST INDIES, EDUCATION IN THE SMALLER ISLANDS OF.

WINES, ENOCH COBB (1806–1879). — Leader in the movement that established reform schools for juvenile delinquents; was graduated from Middlebury College in 1827. He was instructor in elementary and secondary schools in Vermont, Pennsylvania, and Virginia; principal of the academy at Burlington, N.J.; professor in Washington College, and president of a higher institution at St. Louis. He was one of the organizers of the American Prison Reform Association and was active in the establishment of reform schools for juvenile delinquents. His publications include *How shall I Govern my School* (1837), *Hints on a System of Popular Education* (1839), *Letters to School Children* (1839), *State Prisons and Child Saving Institutions* (1880), and numerous works on penology. W. S. M.

See REFORMATORY EDUCATION.

WINKELSCHULE. — A term of contempt which arose in the Middle Ages for unauthorized private schools. They sprang up in Germany as early as the fourteenth century. At first they competed with the Latin schools which were attached to the church or whose teachers were at any rate licensed by the ecclesiastical authorities. Sometimes a private schoolmaster received authority to teach the rudiments of Latin to young children as a preparation for the Latin school. But it was rather in the field of elementary education that the private schools flourished. With the growth of towns and the increase of commercial activities, the demand for a knowledge of reading, writing, and ciphering grew up. Frequently the municipal authorities licensed one or two teachers. But by their side there sprang up in side streets and alleys (whence *Winkelschule*) unlicensed teachers, ready to underbid. Arrangements were sometimes made by which the private teacher paid a certain proportion of his fees to the official teacher, but this practice was not common. The private *Winkelschulmeister* were drawn from all classes, — in the early stages mainly from the clergy and wandering students (see BACCHANTS; TRAVELING TEACHERS); later they were recruited from all professions and industries. When the gilds of teachers arose, the *Winkelschulen* were schools kept by teachers who were not gild members. Later still, after the Reformation, such private unauthorized schools frequently gave religious instruction which was not welcome to the official denomination. This was true in Germany, Austria, France, and England, where unlicensed teachers were pursued by the penal laws. Some attempt to control the private schools was made in Prussia in 1738 and later in 1763 (*Generallandsschulreglement*) and in 1794 (*Allgemeine Landrecht*) but without much avail. The *Winkelschule* disappeared in most countries as soon as the public school systems were established.

Besides *Winkelschule* numerous other terms of contempt were employed, *e.g.* *Aussenschule*, *Beischule*, *Nebenschule*; *Heck* or *Heckenschule* (Cf. Hedge School) in Hesse; *Klippschule* (either connected with *Klappern*, to chatter, or

Klippa, a cheap coin of base metal — a reference to the low fees) in North Germany; *Dingschule* (from *dingen*, to bargain or haggle, also a reference to the amount of the fees). In France similar schools sprang up near Paris as a protest to the exactions by the precentor of Notre Dame of a proportion of fees received by the teachers. Since many of these schools sprang up in the surrounding woods, they came to be known as *écoles buissonières*. Later the secret schools of the Huguenots were known by the same name.

See Gilds, Teachers'; Hedge Schools; also ABCdarians.

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WISCONSIN, STATE OF. — Organized as a separate territory in 1836, and finally reduced to its present size in 1838, and admitted to the Union as the thirtieth state in 1848. It is located in the North Central division, and has a land area of 55,256 square miles. In size Wisconsin has about the same area as New York and New Jersey combined. For administrative purposes the state is divided into seventy-one counties, and these in turn into towns (townships) and then into cities and school districts. In 1910 Wisconsin had a total population of 2,333,860, and a density of population of 42.2 persons per square mile.

Educational History. — It was not until 1745 that the first permanent white settlement was formed in Wisconsin, at Green Bay, and it is not until 1791 that we find records of a school, — taught by one Jacques Porlier. The school seems to have been of short duration, and it is not until 1817 that permanent schools begin. In that year an English school was opened at Green Bay. From then until 1828 a succession of school masters was employed. The Black Hawk War, in 1832, settled the question of the occupation of the territory, and from 1834 to 1840 settlers came in in numbers. These people were, in large part, of New England stock, and they brought with them the typical New England institutions, — churches, schools, the town and district organization, and the district school meeting. The Michigan school code was in force, but taxation for schools was not much employed until about 1839.

The first public school in Wisconsin was opened in Milwaukee, in 1836, and a second in 1840. Even these, though a tax was levied for them, were in part subscription schools. In 1836 a Board of School Commissioners was selected for the village, and a citizen gave thirteen acres, now in the heart of Milwaukee, to found a high school. No such school was founded, however, and the donation was allowed to lapse. In 1837 the first territorial legislature created a University of Wisconsin, somewhat after the model of the University of New York (*q.v.*), and provided for a Board of Trustees, who were "to establish colleges, academies, and schools, dependent on the University." This was located at the then capital of the territory, Belmont, now in Iowa. The trustees were appointed, but no further action was taken. The Michigan school code was continued in force, as sufficient for all needs. In 1838, on the organization of Iowa territory, the capital was transferred to Madison, and the location of the University was transferred there also, though it was twelve years before the preparatory department, and thirteen years before the college, was opened for instruction. In 1839 the Michigan school code was revised, and the first Wisconsin school code enacted. The next year the town school commissioners of the old Michigan code were restored, and five district officers for each school district in the town (township) were also provided for. The commissioners were to be a court of appeal from the actions of the district officers, and were also to make the proper reports to the secretary for the territory. A district tax for buildings was permitted, and an annual school census was ordered taken by the clerk.

In 1841 a lengthy petition was submitted to the legislature, asking for the creation of a territorial superintendent of schools, but without results. In 1843 a bill for free schools was introduced, but this was rejected as impracticable. The district taxes permitted for a school building, however, were increased to maxima of $200 and $300; a fuel tax was levied; rate bills were more definitely provided for; and a district tax, up to 1½ per cent, was also permitted for maintenance. In 1844 it was provided that if a town refused to provide schools, any district might levy a tax for wages and do so, if it saw fit. The year 1845 marked the establishment of the first public free school in Wisconsin, at Kenosha (Southport), and the employment of the first city superintendent of schools by the same city. A special act of the legislature was necessary. This permitted the levy of a tax of $2000 a year for the purpose, provided the people consented to the law, at a special election to be held for that purpose. In 1849 Kenosha also established the first graded schools in the state. In 1847 school district No. 1, in Fond du Lac, was organized by special legislative enactment. A bill for a territorial superintendent of schools passed the assembly in 1846, but failed to secure the approval of the upper house, partly due to the coming of statehood and a desire to leave the matter to the constitutional convention. In 1846 a constitutional convention was called. The constitution adopted, however, was rejected by the people, and in 1847 a new constitutional convention was called. The second constitution was adopted, and Wisconsin was admitted as a state in 1848. With a very few changes the educational provisions of this constitution have continued to to-day.

In 1849 the school laws were revised to harmonize with the new constitutional provisions. The location and appraisal of the school lands was ordered; the University was incorporated, a Board of Regents appointed, and the preparatory department opened; town superintendents were required to certificate the teachers; each town (township) and city was required to raise taxes to share in the income from the state fund (51.8 cents per child by 1850); and town libraries were provided for. In 1857 a State Board of Normal School Regents was created, and the income from one fourth of the swamp land fund was devoted, in the form of subsidies, to the "encouragement of academies and normal schools." In 1859 the Regents were authorized to employ a State Agent to assist the State Superintendent in the organization and conduct of teachers' institutes. In 1863 a normal department was opened at the State University. In 1865 this subsidy system for the training of teachers, which had never been very successful, was entirely abandoned, and a bill for the creation of state normal schools was passed. The state normal school at Platteville was opened in 1866, at Whitewater in 1868, at Oshkosh in 1871, at River Falls in 1875, at Milwaukee in 1885, at Stevens Point in 1894, at Superior in 1896, at La Crosse in 1909, and at Eau Claire in 1913. The Regents were also authorized to expend $5000 a year for teachers' institutes, and this sum has since been continued and increased.

The continual trouble with the town superintendents, and their general inefficiency, led the State Superintendent in 1855 to recommend the creation of county superintendents, but no action was taken on his recommendation until 1861. In that year county superintendents were created, superseding the town superintendents, "to examine and license teachers, and to visit and inspect schools." In 1863 cities were exempted from the supervision of the county superintendent, and in 1870 they were directed to report to the State Superintendent direct. In 1866 a county tax, equal to the state aid, was ordered levied, and the minimum school term was increased from three to five months. In 1868 a State Board of Examiners was created, to examine teachers, and to grant state teachers' certificates, valid in any county in the state. In 1869 the substitution of the township for the district system was made optional, after repeated recommendations to that effect by the State Superintendent, but few towns ever adopted the plan, and it was finally abandoned in 1911. Instruction in a foreign language, for one hour a day, was also permitted this same year. In 1870 the first kindergarten in the state was opened in Milwaukee, and in 1880 the Oshkosh Normal School added a kindergarten training course. In 1871 the State Teachers' Association recommended the first course of study for graded schools and high schools, and in 1872 for country schools. In 1872 the first regular annual appropriation for the University of Wisconsin ($10,000 a year) was begun, and in 1876 this was changed into a fraction of a mill tax, which has since been increased from time to time. In 1873 the legislature directed the State Superintendent to investigate the question of compulsory education, and to report to it. The report revealed a large amount of illiteracy, and awakened much interest, but the first compulsory education law was not enacted until 1879. In 1875 women were made eligible for the office of county superintendent; the Wisconsin Industrial School for Girls was established; and an optional free textbook law was enacted.

The first high school class was graduated at Racine in 1857; the first high school in Milwaukee was not organized until 1868; and by 1875 there were about twenty-five high schools in the state. This year a high school organization law, with $25,000 of state aid, was passed. Eleven new high schools were organized the first year under the law; by 1880 there were ninety-five; by 1890, 166; by 1900, 219; and in 1910, 286, all with four-year courses. In 1878 it was provided that the state aid to the high schools should be for the first five years only; in 1882 the time was extended to ten years; and this limitation was later repealed entirely. In 1881 the beginnings of high school certification were made; in 1883 the State Superintendent was given general supervision of all high schools in the state; in 1885 the state appropriation for high schools was doubled; in 1889 the State Superintendent was authorized to appoint a State High School Inspector; and in 1891 the State Superintendent was given the approval of the certificates of the teachers as well as of the principals of all high schools in the state.

The first graded school was established at Kenosha in 1849, but by 1860 there were less than fifty graded schools in the state. In 1871 a course of study for graded schools was issued, and in 1875 the first state aid for graded schools was granted. By 1880 there were 294 such schools; by 1902 there were 325, and in 1910 there were 431. In 1885 day schools for the deaf in cities were first authorized, and the first of such schools was opened in Milwaukee in 1886, in La Crosse in 1888, and in Oshkosh in 1890. In 1885 the state school for neglected and dependent children was established at Sparta, and opened the next year. In 1887 the minimum school term was increased from five to six months; school meetings, in districts not providing free textbooks, were required to vote annually on the question; and town libraries and a town library fund were recreated. In 1889 the State Superintendent began the preparation of uniform questions for the use of county superintendents in examining teachers, though their use remained optional with the superintendents. In 1893 teachers' certificates, and normal school diplomas from other states were first recognized. In 1895 manual training departments were authorized to be established in ten high schools, with $250 state aid for each, and the State Superintendent was authorized to supervise and to establish the standards for each. In 1897 state examinations for a new county superintendent's certificate were provided for; a transportation law, for children living over a mile and a half from school, and a law permitting a district to contract with an adjoining district for the education of its children, were enacted; and a state school for feebleminded children was established.

In both 1899 and 1901 important legislation was enacted. In 1899 the most important laws were a county teachers' training school law, providing $1250 state aid for two such schools; a law providing for the organization of teachers' institutes by the State Superintendent, with institute conductors' schools; the extension of the minimum school term from six to seven months; the extension of the township library law to include fourth-class cities (under 10,000); joint high schools were made easier to organize; college graduates, to be certificated, must have studied psychology and pedagogy; city certificates in special branches were authorized; kindergartens were authorized for all third and fourth class cities; and the teachers' institute fund, and the number of manual training departments aided, were both increased. In 1901 the compulsory education law was extended from 7–13 to 7–14 years; agriculture was added to all examinations for teachers' certificates; graded schools were to be classified as first and second class, a state inspector of graded schools was authorized, and state aid for such schools was granted; kindergarten certificates were provided for; the high school tuition of nonresident pupils was ordered paid by the home town; county schools of agriculture and domestic science were authorized, with $2500 state aid to each; school boards in cities were authorized to provide free lectures; state inspection of day schools for the deaf was begun; and township consolidation and transportation of pupils was authorized. In 1903 the compulsory school law was materially strengthened; and the State Superintendent was instructed to approve commercial courses and commercial schools.

Beginning in 1905, much important additional legislation has been enacted. In 1905 the State Superintendent was ordered to furnish card catalogues to, and to supervise the management of, the township libraries; to issue a course of study for the day schools for the deaf in the state; the maximum township school tax was increased from 1 to 2 per cent; school districts and boards of education were authorized to associate themselves together for the purpose of providing fire and tornado insurance for school buildings; district meetings were ordered to vote on the question of providing a second teacher, whenever the enrollment in a school reached sixty-five; county school board officers' conventions were ordered; the state aid for high schools and for graded schools were both increased; a state rural school inspector was authorized; and special teachers' certificates for special supervision in cities were created. In 1907, besides much minor legislation on schools, the important laws provided for the classification and approval of rural schools, with state aid therefor; the revision and strengthening of the compulsory education law, and its extension to deaf children; permission to establish day schools for the blind, to be under state inspection; state aid to districts providing transportation, under certain conditions; permissive county uniformity in textbooks, with so-called county boards of education to select the books; the enlargement of lecture and extension work, on the part both of the schools and of the University; permission to cities to establish technical and industrial schools for children over sixteen; the increase of the minimum school term from seven to eight months; and the creation of a State Mining Trade School, to be located at Platteville. The legislation of 1909 included laws relating to the professional training and certification of teachers; providing for the inspection and condemnation of school buildings; providing for an annual state convention of city superintendents; providing state aid for day schools for the blind; and providing for an investigation of the supervision and inspection of schools, and for a commission to investigate night schools. A law providing for county boards of education and the appointment of county superintendents failed of passage; and a teachers' pension law was vetoed, after passage. The important legislation of 1911 included a law creating a State Board of Industrial Education, with general provision for industrial, commercial, continuation, and evening schools, with state supervision, state aid for thirty schools, and a vocational normal school; for additional state aid for county schools of agriculture and domestic economy, and to districts maintaining courses in agriculture, domestic science, and manual training; permitting school boards in cities to establish evening schools, vacation schools, reading rooms, debating clubs, and lecture courses for adults; a teachers' insurance and retirement fund law; abolishing the permissive township unit, and permitting the organization of large consolidated districts; the further revision and strengthening of the compulsory education and child labor laws; and providing for a legislative investigation of the school textbook question.

Present School System. — At the head of the present state school system of Wisconsin is a State Superintendent of Public Instruction, elected by the people, at the April judicial elections, for four-year terms. He is assisted in his work by state supervisors of high schools, graded schools, rural schools, deaf and blind day schools, and industrial education; an Assistant State Superintendent and a number of clerks; and a State Board of Examiners. The State Superintendent directs the work of his assistants; has general supervision over the public schools of the state; is charged with the stimulation of interest in public education throughout the state; prepares lists of books for purchase for school libraries; has supervision over the establishment of county schools of agriculture, domestic science, and manual training, county training schools for teachers, and day schools for the blind and deaf; assists in the formulation of courses of study for such schools; has supervision over all teachers' institutes, and publishes a syllabus of work to be done therein; holds an annual convention with the county superintendents, and one with the city superintendents of the state; prescribes the courses and standards for commercial schools and colleges; helps to locate each county school of agriculture and domestic science, and to outline its instruction; appoints county superintendents, to fill vacancies for unexpired terms; and prepares a biennial report for the governor and the legislature on the condition of the schools of the state. He is *ex officio* a member of the Board of Regents for the State University; the Board of Regents for the Normal Schools; the State Board of Industrial Education; and president of the Board of Control for the State Mining Trade School. The State Board of Examiners consists of three persons, appointed each year by the State Superintendent, to conduct examinations for state certificates only. A committee of three of the Board of Regents of the State Normal Schools, one of whom is the State Superintendent, arranges all details as to the conduct of teachers' institutes. The State Board of Industrial Education is a recent creation, to control the state aid given under the terms of the new law for state aid to industrial, commercial, continuation, and evening schools.

For each county a county superintendent of schools is elected by the people, at the April judicial elections, for two-year terms. His duties include the visitation of schools, outside of cities under city superintendents; the examination and licensing of teachers, and the revocation of certificates, for cause; the organization and conduct of a teachers' institute, and of a convention of school district officers, each year; the reporting of all deaf and blind children in his county to the State Superintendent, and the state institutions for such; and the making of an annual report to the Board of County Supervisors and to the State Superintendent. He serves *ex officio* as one of the members of the board of trustees for any county teachers' training school, or county school of agriculture and domestic science, which may be established in his county.

Below the county are the towns (townships) and the school districts. The township form of organization never made any headway in Wisconsin, and was finally abandoned. In its place the County Board of Supervisors may now organize consolidated districts, as seems best, and of more than thirty-six miles square, if desired. The district system is the one followed, each county being divided into as many school districts as seems necessary or desirable. The Board of Supervisors of each town has power to subdivide the town, and to alter, unite, or subdivide existing districts.

The annual district meeting is a feature of the Wisconsin school system. Besides hearing the reports of the district officers, examining their accounts, and electing to fill vacancies in the District School Board, the annual meeting may perform many functions elsewhere performed by the school district officers. The School District Board has the care and management of all the school property, in all respects; must provide proper heating, ventilating, and sanitary arrangements; must employ and contract with all teachers; may determine what textbooks shall be used in the school, except where county uniformity has been provided for; and must visit the school and examine into its conduct.

City school systems, employing a city superintendent of schools, of which there were sixty-six in 1910, are not under the supervision of the county superintendent, but conduct their own affairs and report direct to the State Superintendent. Each such city is under a board of education, or a board of school commissioners. A few cities operate under the general charter law for cities, while most of them are organized under special acts. For each city a city superintendent of schools is elected, who has the general supervision and administration of the schools of the city, examines and licenses teachers, and makes the required reports to the school board of the city and to the State Superintendent of Schools. In nearly all respects, city school systems conform to the general school laws of the state.

School Support. — The present value of the permanent school fund, nominally, was \$3,926,226 in 1910, but \$1,563,700 of this has been borrowed by the state and spent, and the interest on it at 7 per cent is raised by taxation. The income from the nominal and actual permanent fund was \$200,573 in 1910, or twenty-six cents for each child of school census (4-20) age. The state levies a seven tenths of a mill state tax for schools, $200,000 of which is appropriated from the license fees and taxes on corporations. This produced $1,818,730, in 1910, or $2.33 per school census child. Both of these funds are distributed to the counties, and thence to the districts, solely on the school census basis. The state also makes a number of special annual appropriations for special purposes, such as the state grants to high schools ($500 to $1500 each); graded schools ($200 and $300 each); approved rural schools ($50 each); aid for transportation (ten cents per pupil per day); day schools for the deaf and blind ($150 to $250 for each deaf person per year, and $200 for each blind pupil); classes in manual training, agriculture, and domestic science ($250 to $350 each); industrial schools ($3000 each); county schools of agriculture and domestic economy ($6000 to $8000 each); county training schools ($3500 each); and teachers' institutes ($23,000), which together aggregate quite a large sum.

Each school district, in annual meeting, votes the necessary taxes for buildings, apparatus and equipment, library, and teachers' wages. These taxes, of necessity, run rather high, though if the district has less than 250 inhabitants, the maximum tax, except for building purposes, must not exceed $500 in any year. High school districts levy a sum sufficient to maintain a nine months' school. Cities levy such taxes as are needed to maintain their schools. County taxes are levied for county teachers' training schools, and county schools of agriculture and domestic science. The total cost for maintenance was about eleven millions, at last report, which gives per capita expenditures below the average for the North Central division of states.

Teachers and Training. — The state employed 14,729 teachers in 1910, 12 per cent of whom were men. Of these 9 per cent were graduates of the normal schools, and 13 per cent had studied in normal schools, but had not been graduated. Thirteen per cent of the teachers held state certificates, and the remainder held county or city certificates. For the training of future teachers the state maintains eight state normal schools, — at La Crosse, Milwaukee, Oshkosh, Platteville, River Falls, Stevens Point, Superior, and Whitewater, and a new school is to be established at Eau Claire. These schools are under the control of a State Board of Regents, and are supported, in part, by the income of a state fund, now amounting to $1,957,564 (one fourth of which has been borrowed by the state, at 7 per cent), established by the legislature in 1865 from the proceeds of one half of the nearly 4,000,000 acres of swamp lands granted to the state (see NATIONAL GOVERNMENT AND EDUCATION) but largely by an annual state tax of $340,000 levied for their benefit. In addition, any county not having a state normal school within its borders may establish a county teachers' training school, and provide a two years' course, preparatory for teaching in the rural schools.

Teachers' institutes are under the control of the State Superintendent and a committee of the Board of Regents for the Normal Schools. All institute conductors must hold a conductor's certificate, obtained on examination from the State Superintendent. The State Superintendent prepares a syllabus and outline of the work for the institutes, and holds an institute conductors' institute in preparation. The state appropriates $9000, to be distributed to the counties on teachers employed, and the Normal School Regents also have $14,000 annually for institute purposes.

Educational Conditions. — Wisconsin has a well-organized educational system, and along some lines has done very valuable pioneer work. The State Superintendent possesses more than the usual powers. The county training schools; county schools of agriculture, domestic science, and manual training; local education of the deaf and blind; industrial education in the cities; state inspection of schools; school libraries; state subsidies for a number of desirable educational efforts; and university extension, are marked features of the state school system. The strength of the district system and the census basis of apportionment are the weakest points in the system.

The state has very few negroes, and but one fourth of the population is foreign born. This foreign-born element is largely English, German, and Scandinavian, so that the state has no difficult educational problem in their assimilation. About one half of the total population live in rural districts, and agricultural education has been made a strong feature of the school system. Some progress has been made in the consolidation of districts and the transportation of pupils, but the great strength of the district system makes progress in that direction difficult. A minimum term of eight months has been required of all schools. The state now has good compulsory education and child labor laws.

Secondary Education. — The state had 286 four-year high schools and two three-year high schools in 1910, employing 1334 teachers, and enrolling 27,768 pupils. A State High School Inspector, appointed by the State Superintendent, examines and approves all schools for state aid grants. Graded schools are also inspected and accredited for grants of $200 if alone, and $300 if in connection with a high school. County schools of agriculture and domestic economy may be established by any county, or group of adjacent counties, and state aid of from $6000 to $8000 a year is granted to those meeting certain requirements. Cities may establish industrial, continuation, commercial, and evening trade schools of

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UNIVERSITY OF WISCONSIN.

secondary grade, and state aid up to $3000 a year may now be granted for thirty such. The state is rapidly developing a well-organized system of secondary education, which is to be broad in scope. A state mining trade school, for boys over sixteen, has recently been established at Platteville.

Higher and Special Education. — The University of Wisconsin (*q.v.*), at Madison, stands at the head of the public school system of the state, and is one of the largest and most important of our American universities. The University has the agricultural and mechanical college combined with it, and its work in university extension has recently been developed to a marked degree. The University is assisted in the work of higher education in the state by a number of colleges.

In special institutions the state maintains the Wisconsin Home and Farm School, at Dousman; the Wisconsin State Reformatory, at Green Bay; the Wisconsin Industrial (reformatory) School for Girls, at Milwaukee; the Wisconsin Industrial (reformatory) School for boys, at Waukesha; the Wisconsin School for the Blind, at Janesville; the Wisconsin State School for the Deaf, at Delavan; the Wisconsin Home for the Feeble-Minded, at Chippewa Falls; and the State Public School for Dependent and Neglected Children, at Sparta. E. P. C.

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WISCONSIN, UNIVERSITY OF, MADISON, WIS. — Established as one of the older type of land-grant colleges, — institutions endowed with an assignment of public lands in a pioneer region, to assure settlers of opportunities for higher education as the country should be developed. In 1836 the first territorial legislature passed an act looking toward the creation of such an institution; and a federal grant was made in 1839. In 1848, when title passed to the new state, sales began, and instruction was first given in 1849. But, as was nearly always the case under similar circumstances, the sale of lands was so mismanaged that the income obtained was not sufficient to support the new institution. A supplementary grant, made in 1854, had the same history. The University commanded neither respect nor affection. The successive chancellors, among whom were several men of distinguished ability, had wise plans and high ideals, but could do no more than keep the institution alive. So low did the University sink in the public estimation that a proposal to annul its charter and distribute its funds among the denominational colleges of the state was seriously entertained in 1862.

The second stage in the history of the University begins in 1866, when the lands granted under the Morrill Act of 1862 were conveyed to it. The act requires instruction to be given in agricultural and mechanic arts and the art of war, not excluding other subjects, and was designed to establish all kinds of technical studies and applied science on a par with the so-called liberal arts and preparation for the older professions. The utilizing of the established organization as the basis of the new determined the educational policy of the state in one important respect; namely, it established the principle of concentrating all types of the highest education given by the state in one institution, and thus saved much expense of duplication, and avoided the weakening influence of jealousy, and the scattering of energy and of loyalty. For a generation after the reorganization of 1866, the development of the University took essentially the same course as at the other land-grant colleges, and first clearly laid down at Michigan. Thus, the policy of maintaining parallel courses, ancient classical, modern classical, scientific, historical, and so forth, leading to different degrees, was begun in 1868 and continued to 1903. Coeducation somewhat gradually came to be accepted, being established in unrestricted form in 1874. The accrediting system of admission was introduced in 1876. A fixed proportion of the taxable wealth of the state began reluctantly to be appropriated to the support of the University in the same year, increasing, with some interruptions, from one tenth mill to three eighths mill in 1911. Within the period between the reorganization and 1880 the Colleges of Letters and Science, at first separately organized, were united and firmly established and the Colleges of Law and Engineering fairly started. The College of Agriculture attracted very few students, but carried on investigations of scientific excellence and practical value. The period between 1880 and 1900 was one of general expansion, distinguished by two special tendencies. The first was the beginning and development of graduate instruction; the second the successful effort of the College of Agriculture to reach the people of the state by various forms of university extension. Farmers' institutes, carried on informally since 1880, received state support in 1885. A short course in agriculture, lasting from after the harvest to just before plowing, was established in 1881, and has had great influence, not only in assisting farmers, but in winning public confidence and support.

Since 1900, probably the most notable single tendency in the progress of the University has been the acceptance by the public of a higher standard of profession and technical education. The Law School has advanced its requirements for admission to the equivalent of junior standing in college. Preparation for medicine has been put on the same basis. The College of Engineering has introduced five-year and six-year courses. Above all, the College of Agriculture has suddenly received an influx of students into its four-year course. Within the College of Letters and Science there has been a decided tendency toward an increasing recognition of professional and vocational aims, partly by the organization of special courses, partly in less formal ways. A marked feature of recent years has been the development of university extension. The short courses of the College of Agriculture have been referred to. The College of Engineering has likewise organized courses for artisans and apprentices. But these special courses are only a small part of the activity of the University in this field. In 1907 the department of university extension (*q.v.*) was reorganized and greatly expanded. It now offers instruction by correspondence in most elementary and many advanced courses, not requiring laboratories, which are given in the undergraduate colleges, provides a large number of courses of lectures, issues syllabi of references for debate on topics of public interest and lends books for study in connection with them, sends out exhibits illustrating principles of public hygiene and administration, and responds as freely as possible to inquiries for information of all kinds. Research has been steadily developed since 1890, and strong insistence on research has been an especial feature of the present administration. Closely associated with this matter is the extent to which the state has called upon the University for the guidance of experts, especially in the organization of commissions, temporary or permanent, created for the public protection, for the conservation and development of the public resources, and for the securing of a more exact measure of public justice. The University library in 1911 included 185,000 books and 41,000 pamphlets; and the library of the State Historical Society, which is in the same building on the university grounds, 172,000 books and 174,000 pamphlets. The government of the University is in the hands of a board of fifteen regents, including the President of the University and the State Superintendent of Public Instruction *ex officiis* and thirteen regents appointed by the Governor for a term of six years, two at large, and one from each of the eleven congressional districts of the state.

The total number of the faculty in 1910-1911 was 575; of students, exclusive of those receiving instruction by correspondence, 5748. The following are the divisions of the University, with the distribution of the students in 1910–1911. Colleges offering undergraduate courses: the College of Letters and Science, 2447, of Engineering, 728, and of Agriculture, 743; — the Library School, 34, and the School of Music, 334, with the same admission requirements as the College of Letters and Science; — the Medical School, 57, and the Law School, 158, requiring two years of college work for admission; the Graduate School, 377; — and the extension division, with an enrollment in the correspondence study department of 5936. Included in the total are 1043 students not otherwise enumerated who attended the summer session in 1911, and 557 enrolled in various short courses in the College of Agriculture, extending from twelve to twenty-eight weeks. The University also conducts an agricultural experiment station, the Washburn Observatory, and the State Hygienic Laboratory, administers a college settlement in Milwaukee, and has close relations with the United States Forest Products Laboratory, situated on the campus. The College of Letters and Science, besides giving wholly non-professional instruction in the liberal arts, includes courses in pharmacy (38 students in 1910–1911), journalism (35), and chemistry (88), and a less strictly organized course for the training of teachers (480). The College of Agriculture, besides four-year courses in agriculture (457), and household economics (134), provides a two-year agricultural course (101), and the short courses referred to. The College of Engineering offers an undergraduate course differentiated from the sophomore year: in civil (160), mechanical (97), electrical (112), mining (30), and chemical engineering, and applied electrochemistry (37); the Law School a three-year professional course; the Medical School the first two years of a medical course. The campus covers 926 acres, mostly on hilly land along the shores of Lake Mendota; the president of the University is Charles Richard Van Hise.

H. B. L.

WITHDRAWAL FROM SCHOOL. — See Attendance, Compulsory; Census, School; Child Labor; Grading and Promotion; Part Time System; Retardation and Elimination of Pupils.

WITHERSPOON, JOHN (1722–1794). — Sixth president of Princeton University; graduated from Edinburgh University in 1742 and engaged in the ministry. He was president of Princeton (then called College of New Jersey) from 1768 to 1783. "His name brought a great succession of students to the college, and by his exertions its funds were much augmented." He gave instruction in theology and mathematics and "was the first man who taught in America the subject of those doctrines of philosophy of mind, which Dr. Reid afterwards developed with so much success." He added French, Hebrew, and international law to the college course, and extended the use of the lecture method. His works, chiefly theological and metaphysical, were edited in four volumes by Dr. Rodgers (1802). W. S. M.

WITTENBERG COLLEGE, SPRINGFIELD, OHIO. — Founded in 1845. The college is supported by the Lutheran Church, but no theological tests are required of either teachers or students, except in the faculty of theology. The attendance has steadily advanced in the last ten years from 294 in 1902 to 808 in 1912. The work of the college is in liberal arts. Since 1905 attention has been given to special work in science. No attempt is made to give full engineering courses, but splendid facilities are offered for two years' work preparing for entrance into technical schools. Courses are offered also in theology, music, art, and agriculture. Wittenberg is a member of the Ohio State College Association and requires fifteen units of credit for entrance. The faculty consists of about forty professors and assistants. A successful summer school is maintained with special reference to teaching.

WITTENBERG, UNIVERSITY OF. — The first German university to be sanctioned directly by the emperor, not by the Pope as in all previous instances, founded by Emperor Maximilian I in the year 1502 as a university of four faculties. Pope Julius, however, confirmed the incorporation. The actual founder of the University was the Elector Ferdinand the Wise, by whom the institution was given a humanistic character from the very beginning. Luther (*q.v.*) came to Wittenberg from Erfurt in 1508, and ten years later Melanchthon (*q.v.*) came to the University from Tübingen and strongly emphasized the humanistic tendencies of the institution. The University entered at this time upon a period of great, though brief, renown, and the number of students grew so rapidly, that an additional building had to be erected. Wittenberg became the center of the Reformation, and although Melanchthon's attacks upon the university system exercised a harmful effect upon the enrollment for a number of years, the institution regained its power during the fourth decade of the (sixteenth) century, and remained in the front rank of German universities for about fifty years. After Luther's death it reflected a more liberal viewpoint in contradistinction to the orthodox University of Jena. During the seventeenth century its influence began to wane, and when, in 1813, its professors took refuge in Schmiedeberg during the siege of the city, little remained to indicate its former glory. In 1815 the institution was amalgamated with the University of Halle (*q.v.*) and removed to the latter city. Gotthold Ephraim Lessing studied at Wittenberg in 1751 and took his master's degree there. R. T., Jr.

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The original lists of matriculants in the University of Wittenberg are deposited in the library of the University of Halle.

WOFFORD COLLEGE, SPARTANBURG, S. C. — Founded by a bequest of Rev. Benjamin Wofford, a retired minister of the M. E. Church, South, who in 1850 left a bequest of $100,000 for the establishment of a college under the control of his denomination. The college was chartered in 1852, and opened for students 1854. Its plant consists of a campus of seventy-five acres and five buildings, valued in all at $300,000. The endowment is $185,000. Faculty and officers number fourteen, and its students 265 (1911–1912). The A.B. degree is given. H. N. S.

WOLFF, CHRISTIAN (1679–1754). — German philosopher, born at Breslau in 1679, studied theology, mathematics, and philosophy at Jena, became a teacher at Leipzig in 1703 and obtained a professorship of mathematics at Halle in 1706. He extended the scope of his lectures to include all branches of philosophy and gained great popularity. Jealous opposition led to his removal in 1723. He found a position at Marburg, where he remained until recalled to Halle by Frederick the Great in 1740. Following the example of Thomasius (*q.v.*) he used the German language in his lectures and many of his writings. He fashioned a precise and expressive philosophical terminology and thus enriched the German language, which still remains a superior medium for the expression of philosophical concepts and principles. He was a systematic, thorough, and logical thinker, to whose example is due in no small measure the exhaustive thoroughness characteristic of the German thinker and writer. He emphasized methodical procedure, definiteness in conception, and cogency in proof, and, accordingly, adopted the method of mathematical demonstration which had previously been suggested by Descartes and used by Spinoza.

Wolff systematized and popularized the philosophy of Leibnitz, but he rejected some of the most characteristic and essential features of the Leibnitzian doctrine, and modified others so as to bring them more into agreement with common-sense views. The theory of monads he weakened by attributing perception only to actual, conscious souls and he limited the preëstablished harmony to the relation of soul and body. He divides metaphysics into ontology, which treats of reality in general, rational psychology, which treats of the soul as a simple substance, cosmology, which considers the world as a whole, and rational theology which discusses the existence and attributes of God. Distinguished from the rational sciences, which are based on concepts, and the rational or deductive method of treatment, are the empirical sciences, which are concerned with the actual, and use the method of observation and description. Thus empirical psychology corresponds to rational psychology, empirical physics to cosmology. His fundamental ethical principle is the idea of perfection and the law of rational morality is to labor for our own perfection and that of others. The will, he holds, is determined by the understanding, and intellectual enlightenment is thus a condition of moral attainment. In his thoroughgoing confidence in the power of reason and his dependence upon the deductive method he is a typical rationalist.

The Leibnitzio-Wolffian philosophy dominated Germany until the time of Kant. Rationalism combined with the new tendency toward freedom in German literature. It combined also with Pietism which at the first was a reaction against orthodoxy at the opposite pole. It affected educational ideals and motives, and gave a strong bias in favor of mathematical methods of instruction in the schools. In particular it became a dominating factor in the reflections of Basedow and was woven into his system of pedagogy as well as his theological views.

Wolff published numerous and, in some instances, extensive works in Latin and German, treating of the various branches of philosophy.
S. W.

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WOLKE, CHRISTIAN HEINRICH (1741–1825). — A German educator of the Philanthropinist (*q.v.*) school, was born at Jever in Oldenburg, and studied law, as well as linguistics, mathematics, and physics at Göttingen and Leipzig. In 1770 he joined Basedow (*q.v.*) in the publication of the *Elementarwerk.* From 1774 to 1784 he taught first under Basedow, then as his successor, at the Dessau Philanthropinum. He also educated Basedow's children, among them his precocious little daughter, Emilie, who under Wolke's tuition learned to read German fluently, soon afterwards was taught French, which she is said to have acquired in three months, and at the age of five began the study of Latin. After leaving Dessau, in consequence of dissensions with Basedow, he went to St. Petersburg, where he was received with great honors by the empress Catharine II, and established a very successful private school. In 1801 he returned to his native place with the title of a Russian "court councillor" and a pension. From 1813 until his death he lived in Berlin engaged in literary and pedagogical work.

Among his writings may be mentioned: *Pädagogische Unterhaltungen* (Dessau, 1777–1784), *Anweisung, wie Kinder Stumme zu Sprachkenntnissen und Begriffen sind zu bringen sind* (*Guide for the instruction of deaf mutes*) (Leipzig, 1804), *Kurze Erziehungslehre* (*Short theory of education*) (Leipzig, 1805). F. M.

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WOLLSTONECRAFT, MARY. — See Godwin, Mary Wollstonecraft.

WOLSEY, THOMAS (1471–1530).— Schoolmaster, school and college founder, Cardinal Archbishop of York, Bishop of Tournay in France, of Badajoz in Spain, and of Lincoln, Bath and Wells, Durham and Winchester, in England, Lord High Chancellor of England. Wolsey, or as he always spelt his own name Wulsey, like Waynefiete (*q.v.*), owed his rise to the highest place in church and state to his success as a schoolmaster, and his fall to his zeal as a school and college founder. Yet his great educational work hardly figures at all, or only in a very secondary way, in modern histories and biographies. Wolsey was born at Ipswich, where his father is said to have been a butcher and certainly was a prosperous citizen. The boy was no doubt educated at the local grammar school. Anthony Wood's statement as to Wolsey's early precocity as a scholar and his being a bachelor at fifteen must be accepted with considerable doubt. The first authentic knowledge we have of him at Oxford is from the records of Magdalen College, where in 1499 he was a fellow and headmaster of Magdalen College School, which stood at its gates and was one of the chief schools in England. He was bursar of the college in 1502–1503, and resigned, owing to some dispute as to hastening the completion of Magdalen Tower, one of the latest and most beautiful pre-Reformation buildings in Oxford. Ecclesiastical preferment came rapidly to him, and he succeeded in attracting the attention of Henry VIII who piled canonries and deaneries on him as a reward for his services as a diplomatist. He accumulated a plurality of bishoprics not only in England but in France and Spain, and in 1514 became Archbishop of York and Cardinal. In 1518 the revision of the statutes of the University of Oxford was referred to Wolsey, who was then not only Papal Legate and so supreme authority in education, but had shown himself a strong supporter of the new studies in the disputes between the Grecians or advocates of humanistic learning and the Trojans or advocates of theological disputations. Following the example of Lady Margaret Tudor (*q.v.*) at Cambridge, he established a readership in Greek, the first public professorship for free lectures at Oxford, and similar lectures in theology, civil law, philosophy, mathematics, and rhetoric, for which he brought over Ludovicus Vives (*q.v.*). The seven public professors (the term is first used in these statutes for public lecturers) were — and this was a great innovation — brought into organic connection with the college he founded, and lecture rooms were provided for them pending the building of new University schools. Besides the public professors, four of the canons were to be elected as "private or domestic" professors in sophistry and humane letters.

Though too busy to undertake the actual work of reform at Oxford or Cambridge, his foundation of Cardinal College proved to be an important step in this direction. In 1524 Wolsey obtained a bull from Clement VII for the suppression of St. Frideswide's Priory at Oxford, the removal of the regular or monastic canons, and the conversion of the institution into a college or collegiate church of secular canons and scholars, thus reversing the process which had taken place 400 years earlier. (See Oxford, University of.) By other bulls monasteries with less than seven monks were suppressed and appropriated to the college, for which a royal license was obtained in 1525, with an income of £2000 a year or double that of the richest colleges of the time. The statutes of Cardinal College, 1525, provided for a dean and sixty canons of the first order (or fellows), and forty petty canons (or scholars) to be elected out of schools which he had established or was going to establish and endow in various parts of the country. As a matter of fact there is no evidence that he established any such schools except that of Ipswich. This school, founded on the model of Winchester (*q.v.*), was on a magnificent scale and was endowed out of suppressed priories, while the old Ipswich grammar school was handed over to Wolsey for the new foundation. The college was intended for a dean, twelve priests, fellows, thirteen poor men, a master, two ushers, fifty scholars, and eight choristers. It was in full working order on Sept. 1, 1528, when Wolsey sent it a grammar and statutes of a most interesting description, being one of the earliest detailed school curricula in England. The school was to be divided into eight forms, as at Deventer and later at Strassburg, thus improving on Eton and Winchester which had only seven.

Complaints from suppressed monasteries, charges of unfair discrimination in return for contributions to the college, an outbreak of heresy in Cardinal College, especially among the canons imported from Cambridge, and finally aggravated by Wolsey's conduct in the matter of the divorce of Catharine of Aragon led to his fall in 1529.

On Sept. 19, 1530, the Ipswich college after two years' existence was, mainly on the pressure of the Duke of Norfolk, the leader of the reactionary party, declared forfeited to the crown. Nothing but a single red brick gateway of it now remains. The school was allowed to continue, and some £40 a year out of its great endowment was eventually assigned to it, charged on the crown revenues of Suffolk. It eventually obtained a dissolved friary for a schoolhouse and thrives as a local school to this day, but on a very different scale from that projected. Cardinal College, Oxford, was also dissolved, but was eventually in part refounded as Christ Church, and even in its lessened state was by far the largest of Oxford colleges and also the cathedral of the diocese. The fate of his colleges affected Wolsey more adversely than anything else, and hastened the death of this great educational projector in 1530. Probably never before or since has zeal for education played so prominent a part in the fall of a great statesman. A. F. L.

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WOMAN'S COLLEGE OF BALTIMORE, BALTIMORE, MD. — See Goucher College.

WOMEN, HIGHER EDUCATION OF. — **Historical Sketch.** — No part of the history of education is so obscure as that of the education of girls. This obscurity is itself suggestive that little is known because there is little to know. Our educational institutions and practices descend from Greece (*q.v.*). In Ionian Hellas it seems to have been an accepted dogma that no respectable girl was educated; education, including a knowledge of music, singing, poetry, and the power of conversation, was left to the *Hetæræ*. (See Greece, Education in.) At Rome, on the other hand, it has been positively asserted that girls received the same education as boys and, indeed, attended the same schools. But the assertion is an absolute contradiction to the whole attitude of Roman law and Roman thought to women. If, however, little girls did go to the grammar schools, these were little more than preparatory schools up to thirteen or fourteen years old. There is no suggestion that girls attended the rhetoric schools, which corresponded to our secondary schools and universities. Some women undoubtedly were well educated, like Cornelia, Pompey's fourth wife, who, according to Plutarch (*Pompey IV*), not only was versed in literature and played the lyre, but understood geometry and had made progress in philosophy. But it is significantly added that she was not a prig. So we hear from Suetonius (*De illust. gram.*, 16) of a Greek freedman acting as tutor (and also lover) to the daughter of his patron, a Roman knight. On the other hand, Pliny's wife, who recited and sang his verses and those of other poets, had no teacher, but learnt from love. Martial (xiii, 98) speaks of a wife "rich, noble, learned, and chaste," and (x, 35) praising the love poems of Sulpicia says, if Sappho had had her for mistress, she would have been more learned and more chaste; in an epigram on another female poet, Theophila (vii, 69), he makes exactly the same point in another form. But both these poetesses wrote apparently in Latin, and the writing of Latin poems by Latin women required no more schooling than was required by the female novelist of the last century. But Juvenal lashes the ladies who talked Greek as if they were as bad as those "with a past." The absolute absence in Quintilian of any reference to the education of girls may be taken as conclusive that as a rule they were not educated. Certainly there was no system of girls' schools. The female philosophy lecturer, Hypatia (*q.v.*) seems to have been a solitary phenomenon, and it is on record that she was taught by her father, himself a professor.

The earliest authentic illustrious example of women's education in the Middle Ages is Eustochium (*q.v.*), daughter of Paula, Jerome's friend, who in 404 succeeded her mother as head of the convent they had established at Bethlehem. Jerome tells how she had learnt not only Greek, but also Hebrew, in order to be able to sing the psalms. Contrary as it may be to current and preconceived ideas, it may be laid down that no girls were sent to convents for education except those who were going to become nuns, and then always with the same object of learning the scriptures and taking part in services. About the year 534, Cæsarius (St. Césaire), Bishop of Arles, established a nunnery under his sister, Cæsaria, with a rule which is said to be the first rule for nuns as distinct from monks. It has been cited as showing that these nuns were to be learned because Rule XVII begins *omnes litteras discant*. Such a rule addressed to an English monastery a century later would certainly mean a high education, learning Latin grammar and literature. But at Arles in 534 Latin was still the vulgar tongue, and the rule meant no more than that the nuns were to learn to read. This is shown by the concluding words of the rule, that "at all seasons" — not only in Lent, as the Benedictine rule required — "they shall have leisure for reading for two hours, viz., from dawn to the second hour." Cæsarius' *Rule* for monks prescribed three hours for reading. That the nuns were not intended to act as nurses or teachers of others is made clear by the positive prohibition in Rule V, that "no little girl (*infantula parvula*) shall ever be taken into the monastery unless she is six or seven years old and able to learn to read (*litteras discere*) and to do service. The daughters of gentlemen or others (*nobilium seu ignobilium*) shall never be received for nursing or teaching." This prohibition was probably not founded on any objection to learning but, like the similar prohibition against taking in washing, was intended to cut nuns off from all intercourse with outside. A nunnery was still regarded as a place for penance, not a quiet retreat, and according to the synod of Agde, at which Cæsarius was present in 506, no women were to be veiled as nuns under forty years old.

In view of these facts it is not surprising to find that while many learned nuns undoubtedly existed in the early centuries of establishment of nunneries in France, England, and Germany, it is not possible to find any warrant for the inference that they kept schools except for novices and nuns. Wrong conclusions or rash inferences have been drawn from the fact that, in spite of all prohibitions, nunneries and monasteries were treated as convenient *crèches* for young children to be nursed. Hence instances of learned nuns and abbesses can easily be multiplied, but the evidence for schools is slight. In England five men, who later became bishops, are said to have studied the scriptures under Abbess Hilda, the patron of Cædmon, while St. Guthlac is said to have gone to Repton nunnery in 694 to study there under the Abbess Ælfthryth, but his biographer does not hint at lady teachers there. Aldhelm in his treatise on virginity to Hildolith and nine other nuns praises them as "gymnasophists, scholars, and fighters in the arena of learning, who like bees collect materials for study from everywhere, study the fathers and rules of grammarians, the laws of accents" and prosody. Boniface continued after leaving England to correspond with learned women there; thus the Abbess Eadburg wrote for him "in letters of gold the epistles of St. Paul," and Leobgith or Lioba sent him Latin verses. In the period of Charlemagne some effort was made for girls as well as boys, and the Emperor himself had his daughters as well as his sons instructed in the liberal arts. But in the mandates of 787–789 to establish schools of grammar and song in every monastery, only boys are mentioned.

What has been said of England is true of Germany, — that learned nuns can be mentioned, *e.g.* Roswitha, abbess of Gandersheim who wrote lives of the saints in Latin hexameters modeled on Vergil and dramatized Christian legends in the style of Terence; and Herrad, abbess of Hohenburg and author of *Hortus Deliciarum*. But there were no schools for girls. What education there was was "given exclusively to the nuns or to girls destined to take the veil" (Jourdain, *Excursions Historiques*, 1888, p. 470). Probably the best summary of what was considered to be the proper practice on the question of nunneries and schools is contained in the rule drawn up "from ancient fathers" by Abélard for Héloise as abbess of the nunnery of Paraclete. Abélard definitely prohibits the admission of girls to be brought up in the house (*de puellis non nutriendis in domibus nostris*), and "boys or girls who are accustomed to be boarded or taught (*institui*) there shall be entirely expelled." St. Gilbert, the founder of the bisexual Order of Sempringham, who had, while a secular, as rector, set up a parochial school for boys and girls, excluded outsiders altogether when he established his order, and as to those about to become nuns provided: "Let none speak with the children that are not yet novices except their mistress or prioress. . . . We judge it abominable for any other nun to speak with the novices." In the thirteenth century, the period of Episcopal registers, there are numerous instances of such prohibitions, the rule being broken through financial reasons or pressure of powerful friends. It is significant that at this period, too, the use of Latin among the nuns was declining and communications were made in French or the vernacular, or if in Latin, translations were given. Not only nuns but also anchoresses or female hermits, who were secular, seem to have been forbidden to keep schools, although some of them did (Ailred of Rievaulx, *On the Hermit Life* (*c.* 1150), and the *Ancien Riwle*, largely a translation of Ailred, a century later).

There is also evidence of secular girls going occasionally to secular schools in the twelfth and thirteenth century romances, if they are to be trusted as pictures of real life (H. Jacobius, *Die Erziehung des Edelfraüleins im alten Frankreich*, 1908). These girls learned of course to spin and weave and work hangings for hall and church, but Flore and Blancheflor went to school together at five years old and used to kiss each other on going home from school. They wrote letters and love verses in wax on tables of ivory with gold or silver styles, and could speak Latin. Yet they left school at ten years old. Ydain, in the *Knight of the Swan*, was as advanced at four as most children at seven. Flordespine was very learned at thirteen and a half, and Melior, daughter of the Emperor of Constantinople, had surpassed all her teachers, of whom she had more than one hundred, at fifteen. The daughter of Ydain had a private tutor, Master Salemon, his chaplain. Some heroines are said to be able to read their psalters and hours. More often they read romances in the vulgar tongue, like that which was so fatal to Paolo and Francesca. Though one heroine, wife of the King of Scotland, had to get her chaplain to read letters to her, other heroines, like Athenais, could do it themselves. Even one waiting-maid is able to write a letter, but she does it very slowly. Dame Prudence read Ovid and Seneca, and Philomela in *Ovid moralisé* knew grammar and classical authors; while the princess in the *Fair Unknown* studied the Seven Arts, including arithmetic and astronomy. Philippe of Novaire, however, thought that a woman ought not to learn Latin or writing unless she was going to be a nun, as it lays her open to seductive letters.

In France there is some evidence of girls' schools not in connection with nunneries. At Paris, in 1292, a schoolmistress, Dame Tryphena, appears as assessed for taxes. An ordinance of 1357 by the precentor of Notre Dame as controller and licenser of the petty schools (*parvarum scolarum grammaticalium*) of Paris, absolutely forbids masters to receive girls, and mistresses to receive boys, into their schools. In 1380 no less than forty-one masters and twenty-one mistresses (*tam rectores quam rectrices scolarum grammaticalium*) in the various parts of Paris, who formed a gild, were sworn to certain regulations partly to prevent undue competition. In 1405 a schoolmistress at Rouen was excused from taxes on her wine. M. Jourdain, who collected these instances, thinks that the Black Death and the Hundred Years' War extinguished most of these schools. But he had found in 1484 the precentor of Paris licensing "his beloved Perrette la Couppenoire" to keep a school in the parish of St. Germain's Auxerre "to teach and instruct girls in good behavior, grammar (*litteris grammaticalibus*) and other lawful things." As grammar schools, the great grammar schools were under the chancellor, not the precentor, M. Jourdain interprets grammar as only learning to read. These *petites écoles* went on under twenty mistresses, of whom five were married women.

In England no trace has yet been found of any mention of a schoolmistress except Matilda Marcflete, who is described as such (*magistra scolarum*) when admitted a member of the Corpus Christi gild of Boston, Lincolnshire, in 1404. There is nothing to show whether she taught boys or girls or kept a reading and singing or a higher school. It has indeed been sought to build a whole system of girls' schools on the "saving" clause in the Statute of Apprentices which, while forbidding people in the country who possessed less than 40*s.* a year in land to apprentice their children in the towns, "provided always that every man and woman of whatever estate or condition, shall be free to send his son or daughter to learn literature (*apprendre letture*) at any school they please in the kingdom." But this clause would be satisfied by the sending a girl to a convent to be made a nun. We can hardly argue from this single mention a whole system of girls' schools, of which there is no other evidence forthcoming. An instance of an old priest in the city of London teaching little girls as well as boys has been found by Mr. de

Montmorency in a suit in Chancery, in 1484. This was a school apparently like the *petites écoles* of Paris, being one in which this little girl of eight years was taught "the Pater Noster, ave and credo with further lernyng" with "other younge children of the number of xxxii."

In the latter part of the fourteenth century, perhaps owing to the necessity of making money caused by the lowering of rents after the Black Death, the rule against girls in nunneries seems to have been relaxed. Though in 1359, at Elstow, Beds, every secular was to be turned out because by the living together of secular women and nuns the contemplation of religion is withdrawn and scandal engendered; at Farwell, in 1367, no nun is allowed to keep with her for education more than one child, nor any male child over seven, and that not without leave of the bishop. In the first half of the fifteenth century Gerson (*q.v.*), the Chancellor of Paris, speaks of the detestable morals sometimes learned by boys and girls in the boarding schools of the religious (*religionum et scholarum contubermiis*). Yet in Germany Johann Busch, sent to reform the Magdalen Kloster at Hildesheim, *c.* 1450, writes (*Liber de reformatione monasteriorum*, Ed. Grübe, 1857), "First of all the secular girls whom the nuns had with them (not that they might take the veil but that they might learn good manners and discipline and that they might not see or hear in the world anything improper) these we ordered to leave the convent lest they should hinder the cloister discipline and the devotion of the nuns." Similar orders were given at Dorstad and Neuwerk.

The theory that the nunneries in general were "Shee-colleges" and that there was a widespread system of education in them dates from long after the Dissolution and appears to be, as far as England is concerned, wholly due to Fuller's *Church History*, published about 1655, and Tanner's *Notitia Monastica*, posthumously published in 1744, which repeats Fuller with notes of his own. Fuller, after making the demonstrably false statement that there "being a great paucity of grammar schools" (which there was not, see CATHEDRAL SCHOOLS; COLLEGES; CHANTRY SCHOOLS; ENDOWMENTS; FREE SCHOOLS) the monasteries served as such, says, "Nunneries were good shee-schools wherein the girls and maids of the neighborhood were taught to read and work and sometimes a little Latin." He gives reference to Carrow nunnery, near and now part of Norwich, and Dartford nunnery, Kent. In the case of Dartford, the evidence consists only in a reference, not to girls being educated but to girls of noble birth being admitted as nuns. The case of Swine rests on a statement by the late Professor Thorold Rogers in *Work and Wages* that girls were educated there, but the only reference given by him is to three women as "boarders" there, said to occur in an account roll at the Record Office, which cannot now be found. The case for Carrow rested on two documents. But one, a papal bull of 1273, has no reference to girls or education, but consists of a prohibition against admitting on pressure from nobles more nuns than the revenues would support. The other, a quotation by Tanner from a cellaress' account roll, the date of which he does not give, was a receipt for 13*s.* 4*d.* from Lady Margery Wederly "sojourning there for eleven weeks, and 8*d.* a week for her maid for three weeks." On examination this great *locus classicus* of girls' education shrinks into a mixed boarding house, which possibly included a few girls, never more than six at a time, who may have been receiving some education, though there is absolutely no evidence that they did.

But there are three undoubted evidences of girls at school in nunneries. The earliest is in 1470, when the Prioress of Cornworthy, Devon, sued for the fees due for two daughters of a "gentleman" whom her predecessor had taken in, "to teche them scole" at 1*s.* 8*d.* a week for their "mete and drynke." The other two are at the dissolution of the monasteries. The country gentlemen who acted as commissioners to visit Polesworth nunnery asked for its retention because of the "repayre and resort there of gentlemen's children and sojourners" (not "studiants" as misread in Dugdale's *Monasticon*, ii, 363) "that there do live to the number sometimes of thirty and sometimes of forty or more, that there be right vertuously brought up." It should be observed that the numbers are very vague and that no indication is given as to how many of the thirty or forty were grown-up sojourners, and how many children. At St. Mary's Nunnery, Winchester, which was formally visited on surrender in 1538, though its refoundation, which took place the same year, by letters patent of Henry VIII, had already been determined on, a list is given of twenty-six "children of lords, knights and gentlemen brought up in the said monastery." This was probably the chief girls' school in England, as the neighboring college was the chief boys' school; but whereas the boys numbered at least 100, the girls numbered only twenty-six.

What the girls learned at Winchester or in any nunneries there is no evidence to show. But it is almost certain that the teaching did not include Latin, and therefore was of no great depth, when all the learned books on every subject were still written in Latin. For practically since the twelfth century the nuns themselves had ceased to learn Latin. As early as the thirteenth century, the Benedictine rule had been translated into English for the benefit of the nuns. A rhymed translation into more modern English was made between 1400 and 1425 expressly to make it "intelligible to women who learnt no Latin in their youth, that they may easily learn it." We have already seen how in the thirteenth and fourteenth centuries the nuns were addressed by the bishops in the vernacular French. So the clerk of Godstow who, about 1450, translated the Priory Chartulary into English, says that he did it because " women of religion are excused in reading Latin from much understanding." About the same time the noted Chancellor of Oxford University, Thomas Gascoigne, caused the legend of their patron saint, St. Bridget, to be translated into English for the benefit of the nuns of Sion, " as many of you though you can sing and read yet cannot see what the meaning thereof is." We hear of nunneries with " one psalter in English to understand, another in Latin for services." Bishop Longland's injunctions to Nun Cottam in 1534 were in English.

The Renaissance (*q.v.*) was probably the real cause of the attempted development in nunnery schools. Leonardo Bruni of Arezzo, who died at the age of seventy-four in 1443 after being secretary to four popes, in a treatise *De Studiis et Litteris* addressed to Isabella Malatesta, advocates the classics for women, and the composition of Latin verse. But he does not recommend their proceeding far in some subjects, such as geometry or rhetoric, as to which he remarks that which Demosthenes said, action was the first, second, and third requisites, for " a woman who swept her arm about while speaking and raised her voice would be taken for a mad woman and to be put in a strait waistcoat." Vittorino da Feltre, Leonardo's contemporary, in his " Palace School " of La Giocosa at Mantua in 1423 included girls, but only those of the reigning Marquis, Cecilia Gonzaga, and Barbara von Hohenzollern, who married the young Gonzaga. They learned Greek and Latin like the boys. On Cecilia the training had the unfortunate effect that, against her parents' wishes, she became a nun. Leonardo and Vittorino were not, however, followed by other Italian humanist educationalists, theoretical or practical. The Florentine, Alberti, in his *Cura della Famiglia*, thought that " honesty " required women " to keep silence and to listen." It was not till the last twenty years of the fifteenth century that even in Italy we find learned great ladies like the Duchess Elizabeth of Urbino, Gonzaga, Vittorina Colonna, Marchioness of Pescara, or the Venetian Cassandra Fidele who gave women in regard to the highest Italian society and to education something like their modern position. These ladies acquired their learning, not at schools, but at home from private tutors like the thirteenth century ladies of romance. Castiglione in his *Courtier* (*Il Cortegiano*), an imaginary dialogue at the Court of Urbino, written in 1508, treats of the Court Lady as well as the Court Gentleman. He demands that she shall know Greek and Latin as well as Italian literature, and ventures to affirm that " whatever men can know and understand, women can also; and where the intellect of one can penetrate there also can the other." Even in Italy it is clear that this doctrine never extended beyond the highest ranks of the court and merchant princes.

Sir Thomas More was perhaps the first to introduce these ideas of the desirability of education for women into England, where his three daughters learned in their home in Chelsea " to speak well Latin, Greek, and Hebrew." The doctrine was first openly proclaimed in Erasmus' *Institutio Matrimonii Christiani* and the Spanish Ludovico Vives' *De Institutione Feminæ Christianæ* (1523), dedicated to Queen Catharine of England. Neither of them is much more than a *rechauffé* of Leonardo Bruni's views, as in the objection to rhetoric, and in the recommendations of classics and philosophers, " especially those who have written upon self-control, as women specially need this lesson of philosophy." But Vives is less advanced than Castiglione, and specifically forbids the reading of modern literature. In 1525 he became tutor to the Princess Mary, and his somewhat gloomy and ascetic turn of mind was perhaps partly responsible for hers.

It was reserved for Henry Cornelius Agrippa, a German trained in Italy, in his *Nobility of the Female Sex*, addressed to Margaret of Austria, in 1529, to reproduce, north of the Alps, Castiglione's view that women's weaknesses came from their mode of training, and that when educated and " compared with men of like gifts " they are " equal or superior." The Princess Elizabeth, like Mary, acquired her learning in private tuition from Roger Ascham, as did the Lady Jane Grey, whose love of learning was due rather to a preference for reading with a deferential tutor to society in which she was nagged at and even pinched and bullied by her father, the redoubtable Dudley, Duke of Northumberland.

From 1500 onwards these ideas were no doubt beginning to spread. As the only real evidence we have of anything like genuine girls' schools in nunneries — and those entirely of the highest classes, noblemen's and country gentlemen's or rich merchants' children — is at the very end of the nunneries' existence, it seems probable that, instead of their being an ancient custom, they were really a recent innovation. However that may be, in England the dissolution of monasteries cut short any development of the kind that may have been possible. We still hear of learned ladies like the Ropers, Sir Thomas More's granddaughters, and the four daughters of Sir Anthony Coke, Lady Mary, Countess of Pembroke, Sidney's sister, and Lord Burleigh's three daughters, one of whom wrote a

Latin epigram from Cornwall to her sister at Court about her husband's going abroad. These ladies, like Boniface's correspondents ten centuries before, figure in all the screeds on women's education, and can hardly be considered typical of girls' education in general. Still it is certain that in the Elizabethan age, there was a more general knowledge at least of the arts of reading and writing and music than at any previous period. Girls were not admitted any more than before to grammar schools, which were legally sacred to boys. The "children" of the Elizabethan school-founders was merely a translation of the *pueri* of the pre-Reformation founders. Yet there must have been some tendency to try to send girls to some of these schools. Shakespeare represents the curate in *Love's Labour's Lost* as telling Holofernes, the schoolmaster, who keeps "the charge-house on the top of the mountain, or mons, the hill" that his parishioners' "sons are well tutored by you and their daughters profit very greatly under you." Again, then, Helena in the *Midsummer Night's Dream* says of Hermia, "She was a vixen when she went to school"; at what school had they been together? In the Rules appended to the statutes of Harrow School, made in 1590, express provision is made that "no girls shall be received to be taught in the same school." If no girls had been admitted or had tried to be admitted to this and other free grammar schools, this provision could hardly have been necessary. With the example of Queen Elizabeth before them, the girls of the period may well have demanded, and in some cases received, the same classical education as their brothers. However, if successful in some cases, they were not successful in general.

In the reign of James and Charles, before the Civil War, the learned women remain *raræ aves*; such as the Princess Elizabeth, daughter of Charles I, whose tutoress, Mrs. Makin (*q.v.*), vouches for her being able at nine years old "to write, read, and in some measure understand Latin, Greek, Hebrew, French, and Italian," while her cousin "the Princess Elizabeth, eldest daughter of the Queen of Bohemia (daughter of James I), is versed in all sorts of choice literature." In the opposite camp in the Civil War was Mrs. Hutchinson, *née* Lucy Aspley, who, learning at home from a tutor and outstepping her brothers in Latin, was an incentive to their efforts at school. The excellency in learning of "the daughters of Dr. Love" (whether the warden of Winchester College or the Puritan preacher hanged by Cornwall is not clear) was also well remembered. Milton's daughters, taught by himself, as is well known, were also learned, but hated their learning. Margaret Lucas, on the other hand, who became Duchess of Newcastle, "by her own genius rather than any timely instruction overtops many grave men." During the Commonwealth new developments of all kinds were tried in education as in other spheres. So we find that at Polesworth in Warwickshire, perhaps in conscious historical remembrance of the reputed Nunnery School there, Sir Francis Nethersole, knight, by deed of March 10, 1655, established what is perhaps the earliest known endowed school for girls as well as boys. It was a "dual," not a mixed school, however, and purely elementary. The school building was divided into two portions, in one of which a master was to teach boys to write and read English, while in the other a mistress was to teach the girls to read and work with the needle.

Contemporaneously in France we have from 1622 to 1628, a series of documents relating to the *Petites Ecoles* of Paris, including in 1625 a list of 42 masters, of whom 20 were priests, and 20 mistresses, 5 of the latter being married women. (Felibien, *Hist. of Paris*, iii, 451.) The celebrated Jansenist *Petites Ecoles* at Port Royal near Paris, established in 1637, included a school for girls as well as for boys. They were both convent schools, though not established, as usual, in the convent, but outside its gates. The whole tone of the school under Mère Agnes Arnauld and Jacqueline Pascal was religious and ascetic. The girls were to learn a little Latin with a Latin Psalter, but their schoolbooks were strictly limited to those of a devotional character. These schools were closed by royal decree in 1661. In 1689 a fierce attack was made on the Precentor of Notre Dame for the wretched teachers he appointed to the boys' and girls' *petites écoles*. In Germany we find in Lübeck, in 1643, 25 school dames who taught reading (Lesemütter) as against 6 male teachers. In 1653, an attempt was made to bring them under control by establishing a gild of reading teachers, who were to be licensed by the town council. At Esslingen in 1656 there were two German — as distinguished from Latin — schools, one for boys and one, which was under a mistress, for girls. At Hohenstein in Saxony, a brandy distiller taught in a girls' school. At Selingstadt in Hesse, after a long struggle with the abbey, a German girls' schoolmaster, who was also bell ringer, was established. (Konrad Fischer, *Geschichte des Deutschen Volksschul Lehrerstandes*, I, viii, 206.)

During the abeyance of church control of education in England under the Commonwealth, large numbers of unlicensed private schools of various kinds had sprung up, among them probably girls' schools. At all events we find many private girls' schools after the Restoration. Mrs. Makin in 1673 dedicated to her Highness the Lady Mary, eldest daughter of H.R.H. the Duke of York, afterward James II "an Essay to revive" what she called "the ancient education of Gentlewomen in Religion, manners, Arts and Tongues With an answer to the objections against this Way of Education." It was an eloquent and well-reasoned plea for the education of women on the same lines as men. (See MAKIN, BATHSUA; also PERWICK, MRS.)

From this time onward there is evidence of plenty of girls' boarding schools, but they aimed at "breeding," deportment, and the accomplishments, not at learning. Thus we find in 1677 an advertisement that "in Oxford there is set up a boarding school for young gentlewomen (by John Waver, master in the art of dancing) where they may be educated and instructed in the art of dancing, singing, musick, writing and all manner of works." In 1680 "Josias Priests, dancing master, that kept a boarding school for gentlewomen in Leicester Fields is removed to the great schoolhouse in Chelsea, which was Mr. Porman's, where he did teach, and there will continue the said master and others to the improvement of the said school." Hackney, however, was the great place for girls' schools, "the Hackney Sarum schools." In all, dancing and music and "works" were the mainstay, though French also was taught, and of course reading, writing, and English. From this time forward there is no doubt that every English girl of the bourgeois class and upwards could at least read and write English, of which we have no certainty previously, though their spelling was marvelous in its inaccuracy.

In France, Madame de Maintenon, who had experienced the limitations of convent education (though born a Protestant) in her childhood, made a spirited attempt to improve girls' education. After several preliminary efforts from 1680 to 1686, Louis XIV built a school at St. Cyr, under regulations drawn by her, for 250 "young ladies of rank, above all of those whose fathers have died in the service of the State." The *raison d'être* of the school was to be free "of monasticism either in external practices, or in its customs, or in its religious services or in its daily life." Racine and Boileau gave the final touches to its statutes, and Racine wrote *Esther* and *Athalie* for performance by its pupils. But Madame de Maintenon was much behind Mrs. Makin in her views. She ruled out ancient history and geography, she even thought spelling correctly savored too much of the pedant, and her list of books was almost as narrow as that of Port Royal.

In the eighteenth century the attitude to such learned women as Lady Mary Wortley-Montagu, who had Bishop Burnet for tutor, and other "blue stockings" was perhaps more contemptuous than at any previous time. There were schools in plenty, but all aimed merely at accomplishments. For the lower classes, the great spread of charity schools (*q.v.*) to teach girls to become domestic servants also taught them to read and write and do sums. The ordinary parochial day-school, which spread gradually over the country, gave poor girls practically as good an education as the boys of their class. But except that the abandonment of Latin for learned works and the enormous development of English literature gave the few girls who were naturally attracted to reading and literature wider scope, the education of the middle- and upper-class girl showed little improvement. Mrs. Montagu and Elizabeth Carter, the friend of Dr. Johnson, kept up the tradition of the possibility of learned women. But as a rule the Young Ladies' Academies were not much better and often a good deal worse than the governesses under whom the majority of girls of the upper and middle classes suffered at home.

Nineteenth- and Twentieth-century Conditions in England. — The beginning of girls' education on a basis of solid instruction and with the same seriousness of intent as that of boys began with the establishment of Queen's College, London, in 1848. The college grew out of a governesses' Benevolent Institution begun in 1843. After three years it was thought that the best way to help the governesses was to let them help themselves by conferring certificates of competence. But as there was no training for governesses, the grant of certificates was found difficult. In 1847 classes were begun, taught by the professors of King's College, London, especially Professor F. D. Maurice (*q.v.*). On March 29, 1848, the inaugural address of Queen's College, London, at 67 Harley Street, was given by him. It consisted, as for long did the introduction of all the lectures on subjects such as mathematics and Latin — the latter introduced apologetically to prepare the way for teaching English — with an elaborate deprecation of the danger of teaching girls anything thoroughly. In 1853 Queen's College became a real college endowed with its site and buildings and incorporated by royal charter. It was practically a school rather than a university college, as its pupils were admitted at fourteen years old; and some ten years later a school for younger girls was attached to it.

In 1849 Mrs. Reid established in Bedford Square the undenominational Bedford College. At first it included a school, but the want being met by new schools, this one was closed in 1868 or 1869, when Bedford College also was incorporated by charter, being endowed with Mrs. Reid's residuary estate.

In 1850, Miss Frances Mary Buss (*q.v.*), one of the first pupils of Queen's College, opened a private school in Camden Town, under quasi-public auspices, *i.e.* a general superintendence of the vicar and clergy of St. Pancras, as the North London Collegiate School for Ladies, there being another school started at the same time for boys. In 1865 the enrollment in this school had grown to 219, of whom 201 were day-scholars paying £9 9*s*. a year and eighteen boarders at about £55 a year. It is a striking fact that, in giving evidence before the Schools Inquiry Commission in that year, Miss Buss said that there were no girls sufficiently advanced to take mathematics, *i.e.* beyond arithmetic, and that most of them coming at the age of thirteen to fifteen could not do the simplest sum in arithmetic. In 1871 a movement began to endow the school, and in 1875 it and a lower school, also founded by Miss Buss, received under a scheme of the Charity Commissioners an endowment of £20,000 from the Platt Charity. The schools are now known as the Frances Mary Buss Schools.

The Cheltenham Ladies' College was perhaps the first girls' school on precisely the same lines as the "Great Public Schools," being started to do for the girls of Cheltenham what Cheltenham College, begun in 1840, did for its boys. The Rev. A. Watford Bellairs, Inspector of Schools, drew up its prospectus, and the College was opened on Feb. 13, 1854, with one hundred pupils. The first principal was not successful, and the school had gone down when she resigned in 1857. Miss Dorothea Beale (*q.v.*), early pupil and mathematical tutor at Queen's College, was appointed principal on June 16, 1858. In 1864, a boarding-house was opened, and on Jan. 30, 1880, the College was incorporated under the Companies Acts; there were 501 girls and ten boarding-houses. When Miss Beale died in 1906, leaving all her property to the College, of which she had been principal for forty-eight years, there were over 1000 girls, and she had established also in connection with it St. Hilda's College at Oxford for university students from the school.

A great impetus was given to girls' education by the extension of the Cambridge local examinations, at first informally in 1862 by grace of the examiners, but in 1865 on the same terms as to boys.

On the appointment in 1864 of the Commission of Inquiry into Endowed Schools, the question of women's education was brought to the front. Miss Emily Davies wrote an essay to prove that girls had been intended to share equally with boys in the endowed schools. As a matter of history and law, there was absolutely no ground for any such contention. But the agitation which ensued procured the insertion in the Endowed Schools Act, 1869, of a clause directing the Commissioners in framing schemes under the act to provide "so far as conveniently may be for extending to girls the benefit of endowments." Accordingly, in the first scheme that was made for any great town, that for Bradford Grammar School (credited to Charles II in the scheme but which has been shown by the present writer to have been endowed long before it was claimed as confiscated to the Crown in 1548) on Aug. 19, 1871, provision was made for the application of £200, to be increased in certain events to £250 a year, out of the grammar school endowment, for girls' education. With this assistance, more than doubled by private subscriptions, the first girls' grammar school was opened in Bradford on Sept. 27, 1875. This school has had in it, for twenty years or more, some 350 girls, while the boys' school, one of the best in the country, numbered a little over 500. The most striking instance of the new policy of taking a rib out of the endowment of a boys' school to convert it into a girls' school was that of Bedford, which had become very rich through the possession of twelve acres of land in the heart of London. The new scheme on Aug. 4, 1873, divided the income into eleven parts and gave $\frac{4}{11}$ to a high school for girls on a level with the grammar school, and another $\frac{4}{11}$ to a modern school for girls on a line with the modern school for boys. It took nine years to start the two girls' schools, which were both opened on May 1, 1882. In a year there were 131 girls, in six years, 427, and in 1898, 800 girls, and the school has retained that level ever since. The modern school at low fees was less successful, but in 1906 it numbered 300. With its two boys' schools of 850 and 600 each, modern Bedford is a singular instance of a town which has grown and lived on a wise application of educational endowments. Similar success has attended the similar great endowment of the so-called King Edward VI School at Birmingham. This foundation already under act of Parliament gave elementary education to 607 girls, but did nothing for the sisters of the grammar school boys. Under the scheme made in 1878, there is now a high school for 300 girls and four other girls' schools, ranging from 160 to 260 girls.

But the Endowed Schools Commission, like all government departments, worked slowly, and schemes took years to become law. Private enterprise stepped in to fill the gap. The Girls' Public Day School Company, established in 1872, started girls' schools of the public school type as commercial speculations, and almost alone among such enterprises made them both commercially and educationally successful. Its first school was opened in Chelsea, the next at Notting Hill, the third at Croydon. In 1875 the company went beyond London and started schools at Bath, Oxford, and Nottingham. Some of the earlier schools, such as Chelsea, have been closed. But the company, converted into a trust and its schools into endowed schools in 1905 so as to receive government grants, still keeps twenty-nine schools, among the best of the girls' public schools. A rival company on a clerical basis, the Church Schools Company, was started in 1883, but its schools are less in number and smaller in size. The success of the Girls' Public Day Schools Company (*q.v.*) led to extensive imitation by similar schools started on a similar commercial basis in many of the large towns of the North, notably Leeds, tired of waiting for a scheme to give it a girls' school out of the grammar school.

In 1894 a new development of schools for girls in connection with boys' endowments began in the admission of girls in person to the boys' schools. The present writer as Assistant Commissioner under the Endowed Schools Acts was instrumental in establishing by scheme of Jan. 29, 1894, the first of these coeducational secondary schools in Lady Grace Manners' School at Bakewell in Derbyshire, where an old grammar school had long been in abeyance, and the second under somewhat similar circumstances, at Keswick in Cumberland, where girls were admitted as day scholars, while there was also a boarding-school for boys. These examples have been rapidly followed, and many decaying grammar schools, such as that of Lady Berkeley (*q.v.*) at Wootton-under-Edge, have been given new life by the admission of girls and the intellectual competition provoked thereby. These mixed secondary schools are mostly in small country towns or in the lower schools of large towns, with boys chiefly under sixteen. It has been reserved for private enterprise to establish in the Bedales School (*q.v.*) at Petersfield a mixed school on the lines of the great public schools as a boarding-school for girls and boys up to the age of nineteen, in which life is in common, except that the girls do not share in the rougher games. Oddly enough, while some men are keen on coeducation, the opinion of most women engaged in education is now against it.

Since the grants made to local authorities for technical education in 1896 and the power of rating for elementary or secondary education given them in 1902, a large number of what may be called middle secondary schools for girls, either separately or mixed with boys, have been established in every town of 10,000 inhabitants or upwards, at tuition fees ranging from £3 to £12 a year. So that there are now 239 girls' schools receiving grants from the board of education as secondary schools, and 177 such schools which admit both boys and girls. No official statistics are available for the girls' schools of the public school type which do not condescend to accept state aid, but they must be not less than one hundred. So that whereas the Schools Inquiry Commission in 1867 could scrape together only a few dozen of endowed or quasi-public girls' schools, these now exceed 500 in number; while there is no comparison between the buildings, the apparatus, the subjects and methods of instruction in the one period and the other.

The advancement of the education of women in the sphere of the university has been perhaps even more marked than in these secondary schools. In 1862 a proposal to alter the charter of London University so as to admit women was lost by the casting vote of the chancellor. In October, 1869, six women began to work in a hired house at Hitchin for the examination for degrees at Cambridge. In 1873 they moved to the spacious site and buildings of Girton College at Cambridge, incorporated in 1872. The Association for the Higher Education of Women began in 1873 in a hall in a private house which in 1875 became Newnham Hall and was incorporated as Newnham College (*q.v.*), whose quadrangle is double the size of the great court of Trinity, the largest of male colleges, and apart from antiquity is far more beautiful. The claim of women to share the highest studies on a level with men was vindicated when a senior wrangler and a senior classic were found among the women students. At Oxford, Somerville Hall and Lady Margaret Hall, the latter with a church bent, were opened in 1879. In 1878 London University, an examining body merely, threw open its degrees to women. When in 1880 the Victoria University was erected out of Owen's College, Manchester, and the Yorkshire College, Leeds, it was chartered for degrees to women as well as men. Queen Margaret's College for women was established at Glasgow in 1883, and in 1892 the four Scotch universities opened their degrees to women. It is only the accession of women that has prevented these universities from showing a marked reduction in numbers. Durham University in 1895 threw open all its degrees to women except for theology, though it is hard to see why in religion above all things woman is not entitled to study equally with man. Trinity College, Dublin, followed suit. In the new universities of Birmingham and Bristol, women are admitted. Only Oxford and Cambridge, while admitting women to their examinations for degrees, still refuse them the degrees, the certificate of proficiency, and a share in the settlement of the objects and methods of study and examinations which degrees confer.

With this exception it may now be said that throughout the whole range of education, from the infant and elementary school to the highest university course, girls have been put on an equality with boys, exercising and enjoying equal freedom in the choice of subjects of study.

A. F. L.

United States. — The higher education of women has been of such relatively brief duration that it is necessary to outline its history in order to understand its present character and problems. The period of preparation from 1830 to 1865 was a time marked by a ferment of new ideas both in the United States and in Europe. In the United States it was the period of Jacksonian democracy and westward expansion, of transcendentalism in literature and thought, of the antislavery agitation and the early women's rights movement. In Europe it was the period of the revolutions of 1830 and of 1848, of the emancipation of the serfs in Russia, of the winning of Italian independence, and of wide political, economic, and social reforms in England. In such an age belief in the higher education of women was an outgrowth of other beliefs held to be far more important.

The substantial beginnings made in the United States are to be fully appreciated only when viewed against the background of the scattering and superficial education commonly given to the girls of the day. Before 1830 Emma Willard and Catherine Beecher had made striking protests against the accepted type of education for girls, and had established schools to carry out their ideas. In 1834 Mary Lyon began her personal campaign throughout Massachusetts for funds with which to establish a seminary on a nonproprietary basis, governed by a board of trustees and buttressed by invested funds; 1837, the year in which Mount Holyoke Seminary (*q.v.*) was opened, is a significant date in the history of the higher education of women.

From this time on, the founding of seminaries and academies for girls went on apace. The South was especially prolific of them before the Civil War, legislatures often chartering them as colleges with the right of conferring degrees. In the newly opened Middle West both the spirit and the material exigencies of pioneer life fostered coeducation. The Oberlin Collegiate Institute, opened in 1833 with a college charter and changing its name to Oberlin College (*q.v.*) in 1850, offered all its facilities to women from the start. Its seminary department was large, but its college curriculum was said to compare favorably with that of contemporary Yale. Although few women completed the college course, seventy-nine had received the Oberlin B.A. degree by 1865. Antioch College, also in Ohio, opened in 1853 under the presidency of Horace Mann, and was fully coeducational and of high standing for the times, although sorely beset by administrative and financial difficulties. Many denominational colleges of the Middle West and some of the earlier state universities admitted women from the outset, but their resources were meager and their standards uncertain. In practically all of them preparatory departments absorbed many of the men and most of the women students. In the eastern part of the country, Elmira College for women was established before the Civil War by the synod of the Presbyterian Church. It was chartered in 1855 with the provision that "no degree shall be conferred without a course of study equivalent to a full ordinary course of college study as pursued in the colleges of this state, and a serious effort was made to carry out this program." Elmira College has the distinction of being the first women's college chartered in an eastern state. The Civil War checked temporarily the development of higher education.

The period of establishment began just after the Civil War with the opening in 1865 of Vassar College (*q.v.*), chartered in 1861 by the legislature of the state of New York and endowed by its founder, Matthew Vassar, with land, buildings, and funds amounting to nearly $800,000. The idea of gifts for such institutions was already in the minds of others, and within ten years two more colleges for women were endowed, while practically all the state universities and several large private foundations had become coeducational.

In Vassar College was a really notable foundation for the higher education of women, fulfilling Mary Lyon's dream and effort of thirty years before. Matthew Vassar had considered his project for years, and clearly intended that the institution should be a college for women, not a superior seminary. Vassar was from the first on an undenominational although strongly Christian basis, and attracted wide public attention and large numbers of students, about 350 in the first year. Unfortunately Mr. Vassar had expended the greater portion of his gift upon an extensive building and equipment, leaving little endowment for instruction and maintenance. The inadequate and irregular preparation of students and the necessity of admitting enough students to justify so large and expensive an undertaking led to the early establishment of a preparatory department and the recognition of special college students. A strong faculty for the day, of both men and women, was, however, secured, and under the first active president, Rev. John H. Raymond, the problems of the higher education of women were recognized and met with remarkable wisdom and foresight. Latin and mathematics were required for entrance; Greek only in the classical course. The preparatory department, although of diminishing importance, was not finally abolished until 1888; but President Raymond always saw clearly that it was a temporary and disadvantageous expedient, and never ceased to maintain the necessity of having students of full college grade in the majority and of sharply separating the preparatory students from them in subjects and methods of instruction. Only women of maturity and earnest purpose were admitted as special students, and their number steadily lessened.

In 1870 the legislature of Massachusetts chartered Wellesley Female Seminary, changing its name to Wellesley College (*q.v.*) in 1873 and fully empowering it to grant degrees in 1877. This institution was the foundation of Henry F. Durant, a Boston lawyer, who provided it with ample land, a large academic and residence building, and adequate equipment, but with practically no productive endowment. Wellesley was opened in 1875, and for five years maintained a preparatory department. From 1881 to 1883 it required both Latin and Greek for entrance, but subsequently established a scientific course without Greek, leading to the degree of B.S. Special students of maturity have always been admitted.

Smith College (*q.v.*), endowed by the will of Sophia Smith, of Hatfield, Mass., with nearly $400,000, was chartered in 1871 and opened at Northampton, Mass., in 1875 with twelve students. Both Greek and Latin were required for entrance from the first, and the college never maintained a preparatory department. Recognizing the disadvantages, social, financial, and educational, of a large central residence building, it adopted the plan of small dwellings in the housing of its students, adding to their number as students increased. In 1877 certain special students were admitted without Greek, and from 1884 to 1900 courses were established leading to the degrees of B.S. and B.L., which did not require Greek for entrance. Since 1904 all courses have led to the B.A. degree without required Greek. From 1880 to 1902 schools of music and of art were maintained. In its early policies Smith clearly showed the influence of the adjacent New England colleges for men and the sagacity of its first president, Rev. L. Clarke Seelye, who served from its foundation to 1910.

The last of the colleges for women to be largely endowed was Bryn Mawr College, founded by Joseph W. Taylor of Philadelphia, a member of the Society of Friends. It was chartered in 1880, and opened in 1885. The date of its establishment enabled it to profit by the experience of twenty years in the higher education of women. From the first it laid stress on high standards of entrance, tested by examination; and made provision for graduate work of a university character.

In 1888 Mount Holyoke Seminary was chartered as a college and seminary, and in 1893 closed its seminary department. Wells College at Aurora, N.Y., was chartered in 1870. The Women's College of Baltimore, now Goucher College, was opened in 1888 under Methodist auspices. A number of small institutions in the middle and far west attained college rank in this period, notably Mills College in California (1885) and Rockford College in Illinois (1892). These two institutions have closed their preparatory departments within the past year.

In 1870 the University of Michigan, then the strongest and best known of the state universities, opened its doors to women, followed in the same year by the universities of California, Illinois, and Missouri; in 1873 by the Ohio State University; and in 1874 by the University of Wisconsin, which had practically given college instruction to women since 1869. The universities of Utah (1850), Iowa (1856), Kansas (1866), Minnesota (1868), and Nebraska (1871) had been coeducational from their foundation; and the state universities established later accepted coeducation as a matter of course. Only the three southern state universities of Virginia, Georgia, and Louisiana remain closed to women.

During the years between 1870 and 1892 a number of endowed institutions for men first admitted women: Cornell University (founded in 1868) in 1872; The Massachusetts Institute of Technology (founded in 1865) in 1883; Tufts College (founded in 1854) in 1892. Others were coeducational from their foundation: Boston University (1873), Leland Stanford Junior University (1891), the University of Chicago (1892).

From about 1880 we have the introduction into the United States of a modified form of the English type of higher education for women; the affiliated or coördinated college attached to the university for men. The earliest of these was the popularly named "Harvard Annex," whereby, in 1879, the Society for the Collegiate Instruction of Women provided courses for women, taught voluntarily by Harvard professors and paralleling courses given at Harvard. In 1894 this informal association was organized as Radcliffe College, with power to give degrees. All teaching is done by members of the Harvard faculty, but financial and administrative relations are not close. Other important affiliated colleges for women are the H. Sophie Newcomb Memorial College of Tulane University in New Orleans (1886); the College for Women of Western Reserve University in Cleveland (1888); Barnard College of Columbia University (1889); the Women's College of Brown University, not fully organized uutil 1897. These institutions differ considerably in the intimacy of their relations with the university with which they are connected. (See Thomas, M. C., *Education of Women.*)

Graduate Study. — A strong impetus was given in the United States to graduate study of the German or research type by the founding of Cornell University in 1868 and of Johns Hopkins University in 1876. From about 1880 American college women began to seek opportunities for graduate work and to study for advanced degrees, both in the United States and in Europe. While Johns Hopkins has not opened its facilities to women except in its medical department (1893), its influence upon graduate instruction for women has been exerted through Bryn Mawr College, which modeled its graduate school largely after the Johns Hopkins plan. In 1892 Yale University opened its graduate school and its Ph.D. degree to women; the University of Pennsylvania admitted women graduate students in the same year; and the University of Chicago has always placed its large facilities for graduate instruction at the disposal of women. Harvard has never granted university degrees to women, and Radcliffe College is empowered to grant only the bachelor's and the master's degrees. Women doing work for the doctor's degree at Radcliffe receive only a certificate, quite in the Oxford and Cambridge manner. In 1901 31 per cent of the graduate students in the United States were women; in 1911, 30 per cent. Of those receiving the master's degree in 1901, 21 per cent were women; in 1911, 28 per cent. Of those receiving the doctor's degree in 1901, 9 per cent were women; in 1911, 10 per cent. (For figures before 1900, see Thomas, *Education of Women.*)

The Association of Collegiate Alumnæ was organized in 1882 by representative women graduates of eight American institutions, to work for the maintenance of high standards and the extension of opportunities in the higher education of women. In 1911, its corporate or institutional membership included twenty-three American universities and colleges admitting women to the first degree, and nine institutions admitting women to higher degrees, together with a list of approved foreign universities admitting women to higher nonprofessional degrees. It now has forty-three local branches throughout the country, open to women graduates of any of the institutions mentioned. In 1911 its total membership was 4982. It issues a series of publications, and has carried on investigations of many topics connected with the education and occupations of educated women. It also maintains, or administers for other organizations, several fellowships available for graduate study in Europe or America.

Continent of Europe. — On the continent of Europe higher education for women has had to meet intrenched conservatism, religious, social, and political. Its development has been irregular, and in many cases, even when opportunities have been granted, there has been little response on the part of women. The majority of women studying in continental universities have been foreigners. With regard to the education of women, the continental countries fall into the following groups: (1) Switzerland, the Scandinavian countries, including the Grand Duchy of Finland, the Netherlands, and Belgium, in which the absence of a powerful upper class and the prevalence of a more or less democratic spirit have brought about general recognition of the rights of women; (2) the Latin countries, France, Italy, Spain, and Portugal, in which there has never been legal prohibition of the attendance of women upon the universities, but in which the actual attendance of native women has been slight; (3) the German and Austrian empires; and (4) Russia and the lesser Slavonic nations.

The Swiss universities were the first to be practically opened to women. Zürich admitted them by 1867; the others then existing, during the decade. The University of Freiburg, established in 1889, receives them only as hearers. In the early days Russian women, checked in their efforts to secure university education at home, flocked to Zürich. In 1872 108 Russian women studying there were ordered home by the Russian government. The first American women studying abroad went largely to Zürich. In the Swiss universities women matriculate as regular students, and receive university degrees.

In the Scandinavian countries the universities were opened to women in Sweden and Finland in 1870; in Denmark in 1875; in Norway in 1884. In Belgium and the Netherlands they were opened in 1880.

In France none of the sixteen universities in the reorganized state system is closed to women, although Frenchwomen avail themselves slowly of the opportunity. The few women who seek higher education in France do so from professional motives, not for a liberal education, although from 1865 courses of lectures for girls and women were given by university professors, and to-day women of leisure sometimes attend lectures at the Sorbonne. The first woman to apply for admission to a French university was an American, in 1868, seeking medical training. She was followed by numbers of Russian and Polish women, more slowly by native Frenchwomen. In 1882, after the establishment of public lycées or secondary schools for girls in 1880, the Ecole Normale was founded at Sèvres to train women as secondary teachers. Its courses are given largely by professors from the Sorbonne, and its work is of university rather than of normal grade, although it gives no degrees. It is, however, open to only a small number of women. The Collège Sévigné in Paris, founded in 1880 by the Society for the Propagation of Instruction among Women, is of much the same type. In the last ten years the general attendance upon French universities has increased 37 per cent; the attendance of foreigners has increased 196.6, and in certain faculties to an even greater degree. In the four years from 1905 to 1909 the number of women students increased nearly 90 per cent. In 1909 there were 2916 native Frenchwomen in all the French universities out of a total student attendance of about 40,000, and 680 foreign women, of whom the largest number from any one country came from Russia. (*Rep.* U. S. Com. of Ed., 1911.) In Italy university trained women are still exceptional, as they are to a greater degree in Spain and Portugal.

In the states of the German empire and in Austria, university education for women has developed slowly, partly because of views regarding the sphere of women and partly because these universities are state institutions and the possession of their degrees leads to certain positions in the public service. Even where women have been admitted in considerable numbers, it has been as a favor and not as a right. They have been required to ask permission of the minister of public instruction, of the rector of the university, and of individual professors whose courses they wished to attend; and they have had no assured status. For the most part, they have been ranked as hearers, although a few universities have allowed them to matriculate. Foreigners have fared better than native German and Austrian women, since their own college or university degrees have frequently been accepted in place of the "leaving certificates" from the gymnasiums which all Germans have to present. The present movement for the establishment by the state of girls' gymnasiums equal to those for boys will undoubtedly lead to the presence of a larger number of German women in the universities at no distant date. It is difficult to make general statements about university education for women in Germany, since theory and practice frequently differ, and the policy of a given university may change from year to year. Until recently the south German universities were more liberal in their treatment of women than was Prussia. About 1893 the Prussian minister of education sent an inquiry to the ten Prussian universities regarding the admission of women. All replied unfavorably, although degrees of opposition differed. Heidelberg, one of the two universities of Baden, was earlier more cordial to women than it later became. It admits them to the doctor's degree on individual petition. Russian women studied there before 1870, and it was frequented by the earlier American women students. Freiburg, the other university in Baden, Wurzburg, Erlangen, and, since 1903, Munich, the Bavarian universities, admit women to matriculation and degrees. The University of Leipzig in Saxony has for a number of years received a considerable number of women. Of the Prussian universities, Göttingen has been perhaps most hospitable, granting an occasional degree to women by 1895. The University of Berlin was for many years closed to women, but for the last ten years has admitted them as hearers. In 1895 there were said to be only six women in attendance. The Prussian law of 1908, reorganizing girls' higher schools, and putting them legally on a level with those for boys, admits girls with the proper qualifications to matriculation in the Prussian universities. Since then, foreign degrees have been accepted as proof of preparation, and there has been a surprising increase in the number of women students, a high percentage of them matriculating. In 1909–1910 there were 2324 women matriculated in Prussian universities, an increase of 468 over the preceding year. For 1910–1911, the German handbook Minerva reports 1043 women at the University of Berlin alone, out of a total student body of 14,543. Of these, 8425 men and 777 women were matriculated, and 5075 men and 266 women were hearers. At Freiburg there were 2925 men and 155 women matriculated; 125 men and 31 women hearers. At Heidelberg there were 1846 men and 162 women matriculated, and 173 hearers, including women. In 1898–1899 the total number of women studying at all the German universities is said to have been approximately 471. So recently as 1903–1904 there were but 85 matriculated women students in all the German universities, 28 at Heidelberg, 26 at Freiburg, 25 at Munich, 5 at Wurzburg, and 1 at Erlangen. There were 1256 women hearers, 562 of them at the University of Berlin. The only institution which may be said to give separate higher instruction to women is the Victoria Lyceum in Berlin, established in 1869. This, however, does not grant degrees.

In Austria-Hungary women have been admitted as hearers by special permission since 1878. Since 1897 they have been allowed to matriculate in the philosophical faculty. In the summer semester of 1910–1911 there were 6866 men and 282 women matriculated; 1015 men and 294 women hearers.

Strangely enough, it is in Russia that we find the beginnings of European interest in the higher education of women. With the opening of the reign of the liberal Alexander II in 1855 and the emancipation of the serfs, the need of popular education and of trained intelligence in public service increased greatly. The universities were reformed, and students flocked to them in large numbers. From 1856 to 1863 the Russian universities were not legally closed to women, and certain professors willingly admitted them to lectures. By the university legislation of 1863, however, this right was withdrawn, although a majority of the universities themselves were in favor of interpreting the term "auditor" as applying to either sex. In 1867 leading Russian women petitioned for university instruction; and since 1869 courses for women have been given by university professors in St. Petersburg and some of the other university towns, subject, however, to governmental interruption and interference. Russian universities as such are not open to women, and the history of higher education for Russian women is to be sought in the foreign universities which they have attended in such large numbers as to be the prevailing type of woman student in many of them.

Professional and Technical Education. — Of the three learned professions, medicine, law, and theology, medicine is the only one which women have entered in any numbers. In European universities, especially those of the continent, the four faculties under which instruction is given are those of philosophy (or liberal arts), medicine, law, and theology. Hence any university allowing women to matriculate opens to them legally the opportunity for medical training. Practically, however, the permission often rests with the professors concerned; and in many cases, laboratory, hospital, and clinical facilities have been refused. The English universities granting degrees to women, in some cases explicitly withheld the medical degree. All now grant it except the Royal University of Ireland, Trinity College, Dublin, and, of course, Oxford and Cambridge, which grant no degrees to women. In the United States women receive their medical training either in independent medical schools or in medical schools forming part of universities and colleges. The first woman physician in the world, Dr. Elizabeth Blackwell, received her degree in 1848 from a medical school in Geneva, New York, later studying in France. After 1868 American, English, and Russian women studied medicine in Paris or Switzerland. In 1869 several Englishwomen were given formal permission to study medicine at the University of Edinburgh, but were so badly treated that, in 1870, they formed the London School of Medicine for Women. In Russia a women's medical school was opened in 1872. In the United States the medical schools accepted women slowly, so that several women's medical schools were established, in Philadelphia in 1850, in New York in 1863, in Baltimore in 1882. Women are now admitted to some of the best schools in connection with the universities; but other good schools are still closed. The report on medical education in the United States and Canada issued by the Carnegie Foundation in 1910 points out that with the increase in institutions open to women, the number of women studying medicine has of late years decreased. Eighty per cent of the women considered studied at coeducational schools, and on this ground as on the ground of limited facilities the report advises the closing of separate medical schools for women. (Ch. 13.) The *Report* of the United States Commissioner of Education for 1911 gives 810 women studying medicine in the United States, but comparatively few of them are in schools requiring college study or graduation for admission.

Law as a profession for women is far less highly developed than medicine. In Europe, individual women have taken degrees in law at various universities, although legal and traditional barriers usually stand in the way of their becoming lawyers. In the United States a small but increasing number of women have studied law and have been admitted to the bar. The Commissioner's *Report* for 1911 gives 223 women students in law schools. These schools, however, even more than medical schools, are of all grades, and most of the best law schools do not admit women. In Europe a very few women have been admitted to faculties of Protestant theology. In the United States certain denominations, notably the Universalists, have long admitted women ministers. In 1911, 1187 women are reported as studying theology in the United States. The last available census (1900) reports in the United States 7387 women physicians and surgeons, 1010 women lawyers, 3373 women ministers. What proportion of these are university and college graduates it is impossible to say, but it is safe to assume a respectable minority. The facts available for both Europe and America show that the modern educated woman is not entering the learned professions to anything like the degree that it was thought she might enter them, in the early days of higher education for women.

From the modern technical and engineering professions women are for the most part barred, by inclination and by the nature of the work, though in both Europe and the United States there are women architects, and in the United States a few engineers. The Massachusetts Institute of Technology and the scientific school of Cornell University have afforded excellent technical training of the best type to occasional women.

Present Status and Numbers. — Surveying the higher education of women in the United States and in Europe during the period from 1890 to 1910, we are struck with the difference in its development on the two sides of the Atlantic. During these years in the United States university and college education for women has expanded greatly as regards number of students and productive funds. In Europe, on the other hand, its development has been gradual. The United States Commissioner of Education's *Report* for 1910 presents statistics of attendance in the United States for the twenty years from 1890 to 1910 for men, women in coeducational institutions, and women in the sixteen separate colleges for women held to be of first rank. A striking increase of attendance is seen at a glance. The total enrollment has grown from 48,111 in 1890, 38,056 men and 10,054 women, to 171,893 in 1910, 119,578 men and 52,315 women, — 43,441 in coeducational institutions, 8874 in colleges for women. In the 92 colleges for women of the second class there were 10,013 students in 1890; 11,690 in 1910. The different rates of increase, however, are more significant. The number of men students has increased 214.2 per cent; the number of women in coeducational institutions, 438 per cent, and the number of women in the separate colleges for women, 348.4 per cent. That is, in the last twenty years the attendance of women upon higher institutions has increased more rapidly than that of men;

and among women, the attendance upon coeducational institutions has increased more rapidly than upon institutions for women only. In this same period the resources in buildings, equipment, and productive funds of the institutions for both men and women have gained enormously. These two decades have been a period of unprecedented endowment of higher education in the United States, and although institutions for women have been much less richly benefited than those for men, they have received noteworthy benefactions. Women in coeducational institutions have, of course, profited by the gifts or the public funds put at the service of those institutions.

The numbers of women students at Oxford and Cambridge, on the other hand, and even at the British universities granting women degrees, have not increased strikingly in recent years. The two Cambridge colleges for women had 302 students in residence in 1899; 361 in 1910. In 1910, the women students at Oxford numbered only 357. Moreover, education for women in England has been little endowed. The recent increase of women students at the universities of Prussia and France has been noted, but it is too soon to tell its real significance.

From 1890 to 1910, few new institutions for the higher education of women were founded in the United States. In 1893 the Randolph-Macon Women's College was established under Methodist auspices. In 1902 Simmons College, endowed in 1870 by John Simmons of Boston, was established according to the terms of his will to combine liberal and vocational training of college grade. In 1908 the William Smith College for Women was established as an affiliated college of Hobart College (1822). The Connecticut College for Women was chartered in 1911, and is to be opened in 1914. Wheaton Seminary in Norton, Mass., was given a college charter in 1912.

In the United States the expansion in the higher education of women leads us to certain conclusions and brings us face to face with certain problems. In the first place, higher education for women has come to be accepted as a matter of course. Girls and boys of the same social groups are going to college very generally and from much the same motives. Second, the prevalent type of higher education, as of secondary education, in the United States is coeducational in spite of the remarkable growth of the leading women's colleges. A comparison of the relative growth of the two types of institution suggests at least a practical solution of the problem of coeducation. Whatever may be the objections to it — and the arguments for it seem to grow stronger as the grade of education given becomes more advanced — the matter is virtually settled by community sentiment, financial considerations, and accessibility of certain types of institution. Both coeducational and separate higher education for women have apparently come to stay, so that individuals may choose according to their temperament and needs. But the growing realization that education is for the making of citizens lends weight to the contention that it should be given so far as possible under normal conditions of human association.

The new emphasis upon the relations of education to the life of the day has raised many questions regarding the present systems of higher education for both men and women. What shall be the course of study? Which subjects shall be required, if any, and which shall be elective? Shall there be a group system, to give greater continuity and thoroughness? How shall subjects be taught to prepare for modern life while still giving a liberal education? How much responsibility for their own government shall be given to students? With regard to the education of women the old question, shall the education of women differ from the education of men, is asked afresh with the experience of nearly fifty years of women's education behind it. There are positive opinions on both sides, but the evidence is still equivocal. Modern psychology is tentative in its views on the mental differences between the sexes; and the needs of the modern world are to be increasingly met by men and women working in common. Perhaps the solution of the problem will best come gradually through a better regulation of the choice of studies in college, determined more than at present by the types of service which educated men and women can best render to the community, and by a new spirit and outlook in college teaching.

A contribution to this solution is being made to-day through the study by college women of the occupations open to women with higher training. Teaching has been predominatingly the occupation into which college-bred women have gone. Full statistics have not been compiled, but there are several recent valuable studies for individual colleges. In the United States Bryn Mawr College furnishes most complete data. Of its 1076 graduates to Jan. 1, 1911, 28.5 per cent were teachers; 9.2 per cent were in other occupations; 5.5 per cent were studying further: 25.6 per cent were unmarried and without paid occupation; 27 per cent were married and without paid occupation; 2.2 per cent were dead. A study of the 1583 college graduates of Mount Holyoke College from 1890 to 1909 shows that 82 per cent have been for longer or shorter periods in paid occupations. Of these, 78.5 have been teachers. (Hewes, p. 793.) For the University of Wisconsin it is reported in 1909, "Of those who are either temporarily or permanently self-supporting, 88 per cent become teachers and 3.3 per cent engage in library work. No other occupation has a representation of more than 1.5 per cent." (Olin, p. 194.) In a study of the economic status of 377 self-supporting college women made in 1909 for the Association of Collegiate Alumnæ, 317, or 89 per cent, were teachers. Statistics before 1900 are given in President Thomas' monograph on the *Education of Women* and in Mrs. Sidgwick's *Health Statistics of Women Students of Oxford and Cambridge* (1887).

At present college women, both in the United States and in England, are going increasingly into other fields of work, and systematic investigation of these fields is in progress. In 1910 the Women's Educational and Industrial Union of Boston, an organization for the promotion of women's work and welfare, established an appointment bureau to assist college women in securing non-teaching employment and to study existing and potential opportunities for trained women. In 1910 it published Vocations for the Trained Woman; Opportunities Other than Teaching, a survey by men and women experts in various fields. Since then it has issued fourteen special bulletins on opportunities in the Boston area for various kinds of employment. In October 1911 the local alumnæ organizations in New York City, representing nine institutions, established the Intercollegiate Bureau of Occupations, and entered upon the work of placing and of investigation. Early in 1912 a similar bureau was opened in Philadelphia, and Chicago college women are now (1912) maturing plans for a bureau. In 1909 the Association of Collegiate Alumnæ created a standing committee on vocational opportunities other than teaching, which has held two conferences, compiled an occupational card catalogue of college women, published a study of nearly 300 college women engaged in non-teaching occupations, and issued a bulletin giving information about places for vocational training in the United States open to college women. Most of the colleges receiving women have for some years maintained appointment bureaus for assisting their students who seek employment, and these are now coöperating with the newer agencies described above. Englishwomen attacked the problem even earlier. In 1897 they established in London a Central Bureau for the Employment of Women, which has of late years organized a Students' Career Association in close relations with the women's colleges, university graduates, and the girls' schools preparing for college. They now issue bimonthly a magazine, *Women's Employment*, which lists places for vocational training, and studies openings and vocational tendencies.

Out of these movements and others, educational and social, are bound to come a progressive adaptation of women's higher education to the needs of the day, without in the slightest degree sacrificing its high standards, and a fuller realization of the value of the contribution made by the educated woman to the constructive work of the world. In the realm of pure scholarship, also, the modern woman has made and is making substantial contributions. In the future, it is to be hoped that she will reap more of the professional rewards of scholarship. E. K. A.

See College, American; College Attendance; Coeducation; also articles on the various countries; and on the various universities.

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WOMEN TEACHERS. — See Teachers, Sex of.

WOMEN TEACHERS, EQUAL PAY FOR. — See Salaries, Teachers'.

WOMEN'S COLLEGES. — See Women, Higher Education of.

WOMEN'S CLUBS AND EDUCATION. — The rapid growth of women's clubs in numbers, influence, and varied activity is a feature of modern life worthy of careful estimate. The largest federation now includes 6000 clubs, has an aggregate membership of 800,000 women, and works systematically through eleven departments.

Self-education. — In relation to education, the movement may be said to have had three distinct stages. In the first stage, the aim was almost exclusively self-education. Groups of women met for "self-improvement" in so-called study or culture clubs. Because of the general lack fifty years ago of institutional facilities for the education of women, these earnest groups met a real educational need. Small study clubs are still numerous, and many of the largest organizations have departments that are well equipped and conducted by leaders of high professional standing.

Education through Cooperation. — The second stage was marked by an extraordinary impulse toward organization. The clubs developed an intricate system of offices and committees; banded together in municipal, district, state, and national federations, with a hierarchy of officers and committee members; held frequent conventions; and undertook state-wide and nation-wide projects. Whatever the aim, the result has been mutual education, or training in team work, which is most valuable and opportune. The modern community has many problems which must be solved by all its women working together. While the ordinary life of boys and men — in play, education, business, and politics — affords continuous training in team work, the ordinary schooling and pursuits of girls and women tend strongly in the opposite or individualistic direction. In clubs, women have learned to work together in new ways and with an unprecedented freedom from social fetters and class distinctions. If the highest reward of culture is a truly democratic spirit and habit, this result of club life is surely of great educational value.

Direct Educational Work through Social Service. — The third and present stage of the club movement is characterized by social service. Most of it is avowedly for the benefit of women and children; there are many points of contact with the schools, even when the objects sought are juvenile courts, the suppression of child labor, or the establishment of a children's bureau.

The direct educational work undertaken by women's clubs for the assistance of the schools and school children can be outlined broadly and its general scope indicated. Any correct statistical account is as yet impossible, because of the multiplicity of undertakings, their changing character even in a given place, and elasticity in reporting. Many organizations doing valuable work have as yet no system of keeping records, and the best system yet devised is inadequate. Enumeration would show that successful help has been given in some place by some club to almost every possible sort of educational work. A few groups will, however, include the most extensive and significant.

An early and popular kind of assistance may be called — for want of a better name — philanthropic. The maintenance of scholarships and loan funds has been more general than any other one thing. In 1910, nineteen state federations were supporting scholarships, with the aid of nearly 700 clubs. In 1912 twenty-four state federations were helping in this way. The club scholarships range in number in various states from two to forty-five; in opportunity, from university and normal school scholarships to the so-called child-labor scholarship, a wage equivalent which enables children between twelve and fourteen to remain in school and yet meet critical needs at home. The most notable is the International or English scholarship supported by the General Federation and providing graduate study for a young woman after the manner of the Rhodes scholarships for young men. Very generally clubs have made gifts for increasing school equipment, improving school grounds, decorating schoolrooms and buildings — nearly 500 in 1910. Rural schools have been transformed; several have been entirely maintained until public support could be enlisted. In 1911–1912 the Education Committees of twenty state federations worked for improved rural schools. Especially in the South, they have for years aided the School Improvement Associations, which have done heroic service. In one state in 1911, $39,000 was raised and expended; in 1912, $50,000. In another the School Improvement Association leader, formerly a club worker and aided by the clubs, organized leagues in over sixty counties and raised sums for school improvement ranging from $300 to $3200. In the congested districts of cities, clubs provide clothing, books, penny lunches, school nurses, and more recently open air schools for the anæmic and tuberculous, and special schools for the subnormal. These have been sustained in whole or in part. The gifts of one state federation include 100 scholarships, a loan fund of $1500, $3000 raised for kindergartens, the support of one industrial school, and the partial support of four others. Traveling libraries and the nucleus of public libraries have often been given and placed where greatly needed. Club departments of art and of "literature and library extension" are very numerous. One state maintained wholly for two years a free traveling library system which was then recognized by the state and the club committee was made a state commission.

Another large group is of special significance because it deals with interests which formerly belonged in the home, which the century's social and industrial revolution has taken elsewhere, and which now apparently must be accomplished in connection with the schools. As the schools consequently become overburdened, it is fortunate that the homemakers continue their sense of responsibility. Because industrial knowledge and habits of work can no longer be gained in the ordinary home or neighborhood, women's clubs have long been striving for the introduction into the school curriculum of various forms of manual training, domestic science, agricultural or mechanical courses. In 1910 531 clubs were working for industrial education. In 1912 twenty-four state federations were urging and aiding it. During 1912–1914 all will be asked by the central Education Department to help secure vocational education and vocational guidance, especially for children who are or will otherwise be leaving school before they are fourteen and swelling the ranks of the unskilled. For the solution of this and other problems, night schools, vacation schools, and continuation schools have been helped; in some cases they have been entirely supported until their usefulness and success have been proved, and then they have been turned over by the clubs to the public school system. Day nurseries have been established for the care of children whose mothers must follow the industries into factories and stores.

Responsibility for extra time as well as for extra tasks has come upon the schools by changed social conditions, and again the clubs have shared the burden; playgrounds, recreation centers, and social centers were aided in 1910 by 278 clubs, and in 1912 by twenty-eight state federations.

Another group comprises a number of activities which aim to improve the health conditions of school children: work for sanitary school buildings; for proper ventilation of schoolrooms; for individual drinking cups or "bubbling fountains"; for medical inspection of school children for physical defects or for contagious diseases. The education and health committees of thirty-five state federations were in 1912 active in behalf of these vital matters. Because of dangerous conditions which could not be ignored, the attention of all clubs was directed during 1910–1912 to the problems of sex hygiene. They found (in the words of President-Emeritus Eliot of Harvard) that "The first practical measure, to be advocated wherever there is an opportunity, is the introduction of a thorough course in sex hygiene in all normal schools." By questionnaire and correspondence the matter was taken up with the normal school authorities in all states.

In all but four of the state federations legislative committees are ready to give assistance — sometimes decisive assistance — in securing desired school legislation. The clubs can often do more than any other one agency toward gaining effective publicity for the needs of any school or school system. In 1911 fifteen state federations were specially interested in school legislation, and one of them was successful in securing eleven measures. Through legislation and publicity, systematic work for increased school revenues is being planned; clubs in ten states are already interested.

Other Countries. — Club work of the kind indicated seems confined principally to the United States. The clubs in other countries, at least those reporting through the General Federation in China, India, Mexico, Chile, West Australia, as well as Alaska and the Philippines, are of widely different types. Work for schools, as known in the United States, is not reported, except possibly from England and Canada.

Systematic Community Coöperation with Schools. — Perhaps the most important and distinctive "sphere of influence" for women's clubs and other volunteer organizations is that field of difficult determination between the home and the school. Wise occupation of this field depends on close coöperation with school authorities and teachers. This has been brought about locally in many places by Home and School Associations, or Parent-Teachers Associations. Many of these have been organized by the Congress of Mothers; some by the School Improvement Association of the South; some by state federations of clubs.

Coöperation and professional guidance on a national scale were begun in 1907 by the institution of the "Department of Women's National Organizations" — now called "The Department of School Patrons" — in the National Education Association. Affiliated with this department are the General Federation of Women's Clubs, the National Congress of Mothers, the Council of Jewish Women, the Association of Collegiate Alumnæ, and the Southern Association of College Women. The program of work included: (1) Strong and well-enforced child labor and compulsory education laws in every state. (2) A sufficient number of well-equipped and well-cared-for schoolhouses in every community. (3) Expert, paid supervision of all school work. (4) Training for the hand, and moral instruction, in all public schools.

The educational work of women's clubs should improve rapidly by means of such professional guidance, by making effort for each object consecutively until it is complete, and by bringing about in every community the excellent results that have already been accomplished in some and planned in many.

M. G. B.

See Family Education; Parents and Schools; Women, Higher Education of.

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WOMEN'S RIGHTS TO SCHOOL FRANCHISE AND OFFICIAL POSITIONS. — One of the marked characteristics of the past three or four decades has been the extension of educational and political advantages to women, as well as to men. Not only have coeducational high schools been established generally, and universities thrown open to women on the same terms as men (see Women, Higher Education of), but the right to be elected to educational offices and to vote on educational matters has also been somewhat generally extended in the Northern and Western states. Only in the Southern states of the American Union has the movement as yet made practically no progress.

In 1869 the territory of Wyoming began the movement of enfranchising women by granting to them the same rights as men in the territory. Utah followed in 1870, and continued such privileges until 1887. About this same time a number of Northern and Eastern states began to admit women to the right to vote at school elections, and to hold school offices. By 1890 this latter privilege had become somewhat common in the Northern states, and has since been extended. In 1893 Colorado extended the full franchise to women, and was followed by Utah in 1895, Idaho in 1896, Washington in 1910, California in 1911, and Oregon, Arizona, Kansas, and Michigan in 1912. In 1887 Kansas granted women the right to vote on municipal matters, and the full franchise in 1912. In 1898 Louisiana granted women the right to vote on the levy of taxes where they were concerned.

In school matters we to-day find the following conditions, as regards the right of women to vote and to hold educational offices.

States granting no such privileges: Maine, Rhode Island, Pennsylvania, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Texas, Arkansas, Missouri, Indiana.

States where women may vote for local school officers only: Connecticut and Delaware.

States where women may vote for school bonds only: Iowa.

States where women may serve as school trustees, but without the right to vote at school elections: Maine, New Jersey, Kentucky, Illinois, Indiana, Iowa.

States where women may vote for any local school officer, and hold any local school office: New Hampshire, Vermont, Massachusetts, New York, Ohio, Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Montana, Wyoming, Colorado, Oregon, New Mexico, Idaho, Utah, Arizona, Washington, California.

States where women may also hold the office of County Superintendent of Schools: New York,[1] Indiana, Michigan, Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Arizona, Washington, Oregon, California.

States where women may also hold the office of State Superintendent of Public Instruction, or any other educational office: Indiana, Michigan, North Dakota, South Dakota, Kansas, Wyoming, Colorado, Idaho, Utah, Arizona, Washington, Oregon, California.

The results of the extension of the right of the ballot and the right to hold school office is a matter on which there is as yet no great agreement of opinion, or rather very marked and diverging opinions. In many of the Eastern states there is a constant complaint that but few women avail themselves of the privilege. In the Western states women use the ballot more, and many educational offices are filled by them. The general result in states where women have the full franchise in all matters seems to be good. The schools are close to the home, and women, when they understand the issue, have shown themselves far more dependable than men in voting for progressive measures and in the advancement of the real interests of the schools. There is at present every indication that the right of women to vote on school matters and to hold educational offices will be extended in the future, rather than restricted. E. P. C.

In England women have for a long time been permitted to be members of school boards under the old system. Since the Education Act of 1902 women are not only eligible for, but must be appointed to, education committees, while they are eligible to serve as managers on local school committees. Women have the right to vote in elections for local authorities provided they have certain property qualifications; hence they may indirectly vote for members of the education committees. (See England, Education in.) Within recent years the Board of Education has appointed women inspectors of domestic subjects, training colleges for women, and for purposes of medical inspection. In Germany women have no rights either to vote or to serve on school committees, but may be coöpted for purposes of inspecting girls' schools. For Finland, Sweden, and other European states, where women are given some of these rights, see the articles on those countries.

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[1] District Superintendent, an equivalent office.

WOMEN'S TECHNICAL INSTRUCTION. — See Household Arts; Industrial Education; Women, Higher Education of.

WOODBRIDGE, WILLIAM CHANNING (1794–1845). — American educator; born at Medford, Mass., Dec. 18, 1794. Following his graduation at Yale College in 1811, he was three years principal of the academy at Burlington, N.J. He then took a course in theology at the Princeton Theological Seminary, at the completion of which he accepted a post as teacher in the school for the deaf at Hartford. In 1820 he went to Europe to study educational institutions and methods and became deeply interested in the work of Pestalozzi (*q.v.*) at Yverdun, and Fellenberg (*q.v.*) at Hofwyl. He was especially interested in the study of geography, and published after his return to America *Rudiments of Geography* (1822) and *Universal Geography* (1824).

Mr. Woodbridge returned to Europe again in 1825, spending three months with Pestalozzi and Fellenberg, and visiting many Pestalozzian schools in Germany. Upon his return to America in 1829 he became active in the Society for the Improvement of the Common Schools of Connecticut, which had been organized for the purpose of increasing the efficiency of the common schools, organizing institutions for the training of teachers, and increasing the facilities for the education of women. In 1831 he purchased from William Russell (*q.v.*) the *American Journal of Education*. The name was changed to the *American Annals of Education*, and Mr. Woodbridge continued as its editor until 1837. He was keenly interested in the study of vocal music in the schools, and at the first meeting of the American Institute of Instruction in 1830 he read an important paper on the Pestalozzian method of teaching music. He published many papers on education and was joint author with Emma Willard (*q.v.*) of a series of school geographies. W. S. M.

See Journalism, Educational; Pestalozzianism in the United States.

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WOODS HOLE. — See Summer Schools.

WOODS, LEONARD (1807–1878). — President of Bowdoin College; graduated from Union College in 1827 and the Andover Theological Seminary in 1830. He taught for a short time and engaged in the ministry. He was professor at the Bangor Theological Seminary from 1836 to 1839 and president of Bowdoin College from 1839 to 1866.
W. S. M.

WOODWARD, HEZEKIAH (1590–1675). — A realistic educator, especially interested in the education of the defective; born in Worcestershire. He was educated at Balliol College, Oxford. About 1619 he opened a private school at Aldermanbury, where he taught after the methods of Comenius.

Profiting by his own early experiences owing to his stammering, of which he gives an account in the preface of the *Child's Portion* (1640), he turned his attention to education and naturally was interested in the defective child. "If the child be deficient, so much the more need for instruction." Further, he considers that for a manual occupation, *e.g.* that of "the plow or the sea," culture and training of the mind are as necessary as for the child destined for academic studies. The basis of all good education, especially for the backward, is a sharpening of the senses. But the child must be led not only to see with the eye, but with the understanding. Sense training is the right method of education, both for the mentally weak and for the mentally strong, especially in the early stages. Hence Woodward is a follower of Comenius. Before Rousseau, Woodward said, "We must follow Nature," by which he means the child's nature. In 1641 Woodward published *A Light to Grammar and a Gate to Sciences*, and in his insistence upon and suggestions for practice in sense observation, he is an unrecognized pioneer of Pestalozzi.

Further, Woodward was a strong advocate of the use of the vernacular in teaching, and desired to see children engage in nature study. He wishes, as he says, by it "to enfranchise the understanding and make the child a free denizen of the world." Though he desires to moralize nature studies, it is quite clear that his idea of humanistic education includes much of what has been confirmed by modern teachers, besides classical instruction, and that he is entitled to a place in educational history as one who saw the import of realistic training for defective as well as for normal children. F. W.

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WOOLSEY, THEODORE DWIGHT (1801–1889). — President of Yale University;

was graduated from Yale in 1820; studied law for a year in Philadelphia, and later took a course in theology at the Princeton Theological Seminary. He was tutor at Yale for two years, professor from 1831 to 1846, and president of the college from 1846 to 1871. He was the author of a number of works on international law and political science. W. S. M.

WOOLWORTH, SAMUEL BUELL (1800–1880). — Educator; graduated from Hamilton College. He taught in the Monson (Mass.) Academy, was principal of academies in New York, and principal of the Albany Normal School. He was secretary of the Board of Regents of the University of the State of New York from 1856 to 1880, and was one of the founders of the New York Teachers' Association and its president in 1847. W. S. M.

WOOSTER, UNIVERSITY OF, WOOSTER, OHIO. — Founded in 1866 by the Presbyterian Synod of Ohio, the collegiate department being opened in 1870. The medical department was organized in the city of Cleveland in 1870, and discontinued in 1896. The preparatory department was added in 1872 and the music department in 1882. In 1891, after thirty-one years of successful operation, the plant of the university was destroyed by fire, leaving less than $225,000 assets to begin the "New Wooster." Ten years later the institution had total assets of $2,500,000. The general endowments now amount to $1,300,000. The institution is coeducational, admission being by examination or certification from accredited schools, fifteen points being required. The teaching staff numbers forty-two. The summary of attendance for 1911–1912 is as follows: collegiate students 463, preparatory 169, graduates four. The total number of collegiate alumni is 1549. L. E. H.

WORCESTER, JOSEPH EMERSON (1784–1865). — Philologist and textbook author; was graduated from Yale College in 1811. He taught at Salem, Andover, and Cambridge, Mass. His publications include *Geographical Dictionary* (1817), *Gazetteer of the United States* (1818), *Elements of Geography* (1819), *Elements of History* (1826), and *Scriptural Geography* (1828). He published three dictionaries — *Comprehensive Pronouncing and Explanatory Dictionary* (1830), *Universal and Critical Dictionary of the English Language* (1846), and *Dictionary of the English Language* (1860). W. S. M.

See Dictionaries.

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WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MASS. — See Technical Education.

WORD ANALYSIS. — A study once considerably pursued in the high and elementary schools, where the analysis of words by their derivative parts (stems and affixes) was made the chief activity. Various roots, prefixes, and suffixes were first studied, and their recurrence in modified forms was noted in the words of common usage. The purpose of the study is to give the pupil some independent power to gather the meaning, spelling, and pronunciation of unfamiliar words without referring to the dictionary, or to check meanings obtained through context or the dictionary definition. As the process of study emphasizes breaking up unfamiliar words into the units of derivation and blending the original meaning of each part into a whole, the study is called word analysis. H. S.

See Word Study; Word Building.

WORD BLINDNESS. — Among the various forms of aphasia (*q.v.*) is one in which the individual is able to see common objects and recognizes them, but is unable to recognize words. This shows that the psychological processes of recognition are so highly differentiated that the special group of processes involved in the recognition of written and printed words may be impaired without involving other visual functions. The individual is not blind in any general sense, but loses a highly specialized power of recognition. The practical significance of this fact for education is that it concentrates attention upon the process of visual word recognition as a distinct power requiring special and explicit training. C. H. J.

See Aphasia; Word Deafness.

WORD BUILDING. — Word building, or word synthesis, is a form of word study which has grown out of word analysis. It depends on the study of derivative parts, exactly as in the case of word analysis, but emphasizes the synthetic rather than the analytic aspect. In this type of word study the children construct words by modifying the meanings of those they know, changing prefixes, stems, or suffixes as the case may be. Word building is seldom pursued apart from word analysis. It has usually been a subordinate activity in the study of spelling, and is valued chiefly because it seems to call for more active power on the part of the child. H. S.

See Word Study; Word Analysis.

WORD DEAFNESS. — A form of aphasia (*q.v.*) in which an individual, in possession of otherwise unimpaired powers of auditory recognition, is unable to recognize spoken words. The case is analogous to that discussed more fully under the term word blindness (*q.v.*). C. H. J.

WORD METHOD. — See Reading.

WORD STUDY. — The study of words in terms of their derivative parts (stems and affixes) has been an important aspect of the study of spelling in the elementary school. As word analysis it has had time assignment as a special school subject. Once it either completely took the place of spelling in the highest grammar grades or alternated with it, spelling occupying two class periods per week and word analysis three, or vice versa. The work was formal, as formal as the grammar of three decades ago. Soon, however, its relation to spelling became a matter of controversy precisely as the relation of grammar to written and oral composition did. The same pedagogical movements accounted for both controversies. The reaction against word analysis was finally successful, and the title practically disappeared as a subject heading in courses of study. A few conservatives kept it as a distinct subdivision under spelling. Special texts ceased to be used, their place being taken by a few chapters on word study appended to the spelling text. Even these specific chapters devoted exclusively to word study disappeared. The modern speller merely includes occasional exercises in the use of prefixes, suffixes, and roots. These occasional exercises occur throughout the grades and are taught in a distinctly inductive spirit. When the children, in the normal development of their vocabularies, have acquired enough words with a particular common root, prefix or suffix, the child is made conscious of the unit as such through a comparison of words. By the same method he derives its meanings and becomes acquainted with its various forms. Lastly, he extends its applications through practice in the recognition of its use in unfamiliar words or by word building or synthesis.

The special study of words is variously termed in textbooks and courses of study. *Word study*, *word analysis*, *word building*, and *word synthesis* have been among the titles used. Because they have been used interchangeably, much confusion has arisen. The most recent usage, however, tends to discriminate. *Word study* is the all-inclusive activity, covering all the child's study of words, both analytic and synthetic. *Word analysis* applies more especially to the analytical activity where words are separated into their units of derivation. *Word building* (*word synthesis*) refers to the opposite process, where children, knowing the prefixes, suffixes, and stems, are enabled to construct additional derivations, previously unfamiliar to them.

The worth of word study is not to be measured exclusively by its ability to give the child accurate meanings, spellings, and pronunciations. It cannot do this. On this argument word study lost its conspicuous place in the elementary school. It is far better to memorize words outright than to arrive at an approximate and inaccurate conclusion by the identification of explanatory affixes and roots. It must be admitted that word analysis permits a pupil to check tendencies toward error, as when, about to spell Mediterranean, he is in doubt whether the *t* or the *r* is to be doubled. Again, it aids him in getting at the pronunciation of words (though perhaps a sound model is always best) by suggesting the appropriate division of unfamiliar words. After all, the units of division which keep true to the history of the word are very useful; and word analysis does suggest these. The child, too, cannot always consult his dictionary. Context gives much sense to new words, and word analysis aids in checking the contextual suggestions. The method of word analysis is not accurate in giving meaning any more than in suggesting pronunciation and spelling. But it assists in developing independent power. It cannot take the place of good example and drill or persistent consultation of the dictionary, but it is a valuable supplement to these. H. S.

See Word Analysis; Word Building.

WORDSWORTH, WILLIAM. — English poet, born April 7, 1770, at Cockermouth in the beautiful lake region of England always hereafter to be associated with his name. "Poet of Nature," sang Shelley in his *Ode to Wordsworth*, but the word nature had meanings manifold, derived from or associated with Rousseau's teaching of a return to nature as the greatest happiness of man, *i.e.* to the life lived by man before he was corrupted by "civilization." "Everything is good as it comes from the hands of the Author of Nature; but everything degenerates in the hands of man" — this, the opening sentence of *Émile*, became the text of a new gospel. Hence those who yearned to live according to nature, *i.e.* the poets and idealists, yearned also to break down the existing political and social order, and they were enthusiasts for liberty, fraternity, and equality. Shelley could properly say of Wordsworth in 1815, "thy voice did weave songs consecrate to truth and liberty."

Wordsworth's love for humanity was awakened during a residence in France when he was twenty-one or twenty-two years of age. After taking a Cambridge B.A. degree in January, 1791, and after passing some months in London and in Wales, in November, 1791, he went to France, mainly to learn the language. In passing through Paris he picked up a stone of the Bastille, "yet, in honest truth, . . . affecting more emotion than I felt." But after a year spent largely in the home of M. Beaupuy, later a general in the army of the Republic, the young poet's heart was now given unreservedly to liberty, fraternity, and equality, and he wished to join the adherents of the cause. But his English kinsmen, by withholding supplies, called him home in December, 1792. In July, 1793, he watched the English fleet at Portsmouth preparing to attack France (six months before he would have given his life for the cause of France), and he for a time gave up moral questions in despair. He even exulted when Englishmen by thousands were overthrown, — as did also his friend Coleridge, whose voice unaltered sang defeat to English arms and who hung his head and wept at Britain's name. In this year, 1793, the young Wordsworth wrote a letter to the Bishop of Llandaff in which he avowed the boldest of Republican ideas. He now passed through several trying years, until, through the influence of the beauteous forms of nature and of a sister's love, he found tranquil restoration (and, indeed, in time became an English patriot calling on his countrymen to battle with the foe — the French foe). So reconciled to the existing order did he become that in 1815 Shelley in his *Ode to Wordsworth* (he who had sung songs consecrate to truth and liberty) wrote, " Deserting these thou leavest me to grieve," and in 1845 after Wordsworth's acceptance (in 1843) of the Laureateship, Robert Browning sang of The Lost Leader,

> Just for a handful of silver he left us,
> Just for a riband to stick in his coat.

But, however conservative Wordsworth may have become in later years, his early poetry, *i.e.* his best poetry, is saturated with sentiments popularized by Rousseau, which Wordsworth absorbed in his years in France with Beaupuy.

> Once, Man entirely free, alone and wild,
> Was blest as free — for he was Nature's child,

he wrote immediately on his return from France. In *Lines written in early Spring* (1798) every flower " enjoys " the air it breathes, the birds feel a " thrill of pleasure "; this is nature's holy plan, but the young poet feels he has reason " to lament what man has made of man." Man in a state of nature is blessed along with the birds and the flowers, but man's laws and customs and organizations occasion his unhappiness — all quite in the spirit of Rousseau.

Wordsworth's second longest poem, *The Prelude*, or *The Growth of a Poet's Mind*, of over 7000 lines, is an extended treatise on education, in which the poet discusses at length his childhood and school days, his sports and studies, his love for river, wood, and fields, the days at Cambridge, the long vacations (more profitable than the days at college), his subsequent travels and residence in France, and the steps by which he who had once yielded up moral questions in despair found tranquil restoration. In *The Excursion* also an earnest wish is expressed for a system of national education to be established by the government, and its glorious results are foretold.

Wordsworth died April 23, 1850, and was worthily characterized by Alfred Tennyson, his successor in the Laureateship, as " him who uttered nothing base." R. J.

WORK. — See Attention; Effort; Fatigue; Formal Discipline; Interest; Over-pressure in the Schools; Play; School Management.

WORK, OR LABOR, PERMITS. — See Leaving Certificates.

WORKERS' EDUCATIONAL ASSOCIATION, ENGLAND. — An association formed in 1903 " to coördinate existing and to devise fresh means by which working people of all degrees may be raised educationally, plane by plane, until they are able to take advantage of the facilities which are and which may be provided by the universities." It acts as the intermediary between the working men and women and educational authorities and institutions and seeks to provide courses in higher education and create an interest in the existing facilities. The Association not only arranges its courses, but also works in conjunction with universities and education authorities. So far as possible, it is aimed to induce students to arrange courses in sequence or groups, rather than to devote their attention to one or two subjects only. It is found that the interest of the working classes at present is mainly in social and political subjects, including history, economics, political science, and administration, sociology, and industrial questions, but it is felt that while the interests of students should be consulted, a wide outlook will be obtained by a study of other cultural subjects. The Association is made up of local organizations formed into local branches, combined in turn into district authorities, over which is the central authority in London. The central authority acts in an advisory capacity and helps to keep the local organizations in touch with each other. The Association has met with remarkable success, not the least part of which is due to the fact that it brings together in a common cause men and women of all classes, all creeds, and all shades of political opinion, and thus tends " to help England to form a new attitude of mind toward national popular education."

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WORKHOUSE SCHOOLS. — See Poor Law and Education.

WORKINGMEN'S COLLEGE, LONDON. — An institution which grew out of the Christian Socialist movement in the middle of the last century. It was intended by the founders, among the chief of whom were F. D. Maurice (*q.v.*), T. M. Ludlow, Charles Kingsley (*q.v.*), T. Hughes (*q.v.*), E. V. Neale, Lowes Dickinson, and others, to establish an institution where workingmen could obtain a higher liberal education in the humanities and that social life and intercourse which characterizes the older universities. There was some feeling that the mechanics' institutes (*q.v.*) were narrowing their scope and specializing too closely along the practical scientific studies. The members of the first committee recognized the obligation "to regard social, political, or, to use a more general phrase, *human* studies as the primary part of our education." Lectures and classes had already been held in the Hall of Association in Castle St. E., in 1851, and the subjects taught included grammar, history, French, bookkeeping, singing, drawing, political economy, and the Bible. The Workingmen's College was practically founded in 1853, though not opened until 1854 in Red Lion Court. To some extent it was modeled on the People's College, Sheffield, which had been founded in 1842 to give a cultural education, and was organized on a coöperative basis. While Maurice and his associates sought to encourage intercourse between the lower and the upper classes, in the management of the college it was decided, and for a long time adhered to, that the control should be in the hands of the council of founders. In 1857 the college was moved to Gt. Ormond St. and in 1906 to Crowndale Road, St. Pancras. Some of the ablest leaders in thought and public life have been associated with the college as teachers, *e.g.* Ruskin taught art, Hullah music, Westlake law, Furnivall English, and many of the members of the original committee also conducted classes. In the early years only the liberal subjects as they were recognized at the universities were taught. More recently, a preparatory department has been added, and departments for the more general elementary and professional or technical subjects are included in the belief that intellectual work of every kind, if pursued scientifically, is liberalizing. Most of the teachers are unpaid, and include a number who have received their education at the college. But the influence of the college is exercised largely through the social intercourse, for which provision is made in a number of clubs covering many different activities.

A number of Workingmen's Colleges of a similar character were established throughout England, but did not meet with similar success. Among these may be mentioned Cambridge (1855), Manchester (in suburb of Ancoats) (1857), Wolverhampton (1857), Manchester (1858), Salford (1858), Liverpool (1860), Leicester (1862).

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WOTTON, SIR HENRY (1568–1639). — Diplomatist, poet, and provost of Eton College, was educated at Winchester School and New College, Oxford. On leaving Oxford, Wotton traveled for six years, and on his return to England in 1595 (together with Henry Cuffe) became secretary to the Earl of Essex. The Earl of Essex and Cuffe were beheaded, while Wotton escaped to Italy. He settled at Venice and was English ambassador there 1604–1612, 1616–1619, and 1621 1624. He was employed also on diplomatic missions at intervals to France, the Hague, and Vienna. From 1624 till his death in 1639, he was provost of Eton College, a post then worth about £100 a year, in addition to board, lodging, and allowances. "The College," says Izaak Walton, his biographer, "was to his mind, as a quiet harbor to a sea-faring man after a tempestuous voyage."

He wrote a book on education interestingly entitled: *A Philosophical Survey of Education: or Moral Architecture*, in which he shows that education is not only a domestic but also a political concern. He insists on the investigation into the natural capacities and inclinations of children and adapting the "culture and furnishment of the mind accordingly." He also wrote *Aphorisms on Education*, deserving of notice for their "strong wittiness of style. . . ."

Like Sir Thomas Elyot (*q.v.*) Wotton is remarkable as a famous diplomatist who became interested in education, the type of the successful all-round man throwing the light of practical experience on the problems of education in an age before the work of the teacher had become a specialized profession. In addition to his writings on education, and occupancy of the Provostship of Eton College, Wotton interested himself in one of the plans of religious reform which had been suggested by Paolo Sarpi to King James I in 1609, viz.: the foundation of a Protestant college or seminary, on the borders of Italy, to be established for the training of Protestant missionaries, a proposal with which Francis Bacon had agreed, as a counterstroke to the Jesuit College at Rheims. The idea was to send Protestant missionaries throughout Italy, who should first be trained for polemics, and learn the Italian language. But the scheme fell through in the massacre of Protestants in Valtelline in 1620. F. W.

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WRANGLER. — A term applied at Cambridge University (*q.v.*) to those candidates who were placed in the first class of the Mathematical Tripos. It was originally used of those who took part in the disputations. Its first use was in 1739, when John Empson of Catherine Hall was proclaimed "senior wrangler." The title does not appear again until 1747, when the examination for the Mathematical Tripos was introduced. It was not until 1753 that the list of successful candidates was divided into wranglers and "senior optimes," to which "junior optimes" (from the old *et tu optime disputasti*) was later added. The candidate who headed the list was known as senior wrangler, a position which for a long time carried with it considerable honor, and much public interest was always manifested in the results of the Mathematical Tripos. The student last on the list, *i.e.* last of the junior optimes, was known as "the wooden spoon" from the emblem handed to him by the undergraduates at the graduating ceremony. The term was abolished in 1909, and the lists are now published in three classes, the names in each class being arranged in alphabetical order.

WRESTLING. — One of the oldest known sports. It was a favorite exercise among the Greeks, and survived in various forms in all parts of the world up to the present day. Like boxing and fencing, wrestling satisfies man's fighting instinct; this characteristic accounts in large measure for its survival through centuries and in many lands.

There are many different methods or styles of wrestling, such as catch-as-catch-can, collar-and-elbow, Græco-Roman, and various forms of harness wrestling. The most popular and widespread style is catch-as-catch-can. Most healthy boys indulge in this exercise for recreation and as a means of testing their strength and skill, but it is only in the colleges that the sport is taught systematically and regular contests held. The competitors are divided according to weight into seven classes: 115 pounds, 125 pounds, 135 pounds, 145 pounds, 158 pounds, 175 pounds, and unlimited heavy weight. College and intercollegiate championships are held annually in the seven classes.

Wrestling is a splendid exercise for healthy boys and young men; when practiced judiciously, it promotes the development of rugged physical and moral qualities, but it is a dangerous sport for weaklings and those affected with organic defects. G. L. M.

See Athletics, Educational.

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WRIGHT, CARROL DAVIDSON (1840–1909). — Statistician and first president of Clark College; was self-educated. He held numerous government posts and was active in the social and educational betterment of the working classes. He held professorships in social science in the Catholic University and the Columbian University at Washington, and was lecturer on wage statistics at Harvard University. From the organization of Clark College in 1902 to the time of his death he was president of the college. He was the author of a number of works on school and college statistics, industrial education, political economy, and social problems. W. S. M.

WRITER'S CRAMP. — See Writing, Psychology and Hygiene of.

WRITING. — **Historic Evolution.** — The position of writing as an educational subject was naturally far more prominent before than after the invention of printing; but rather as a fine art, taking the place of drawing (or in the coloring of illumination taking the place of painting), than as an instrument of knowledge. Hence it was rather the work of experts than a universal method of communication of ideas, or an instrument of education. It is clear that writing begins by being rough picture drawing. From imitation it becomes symbolic. It then proceeds to phonetic writing, and names of persons or things are denoted by drawings of the rebus-types. Tylor, in his *Anthropology* (p. 170), gives an illustration taken from Endlicher, of Chinese ancient pictures and later cursive forms, in parallel rows, and shows how the evolution of Chinese compound characters of pictures and sounds became necessary. Cuneiform writing is believed to have come from picture writing. Egyptian hieroglyphics developed from elaborate pictures to a system of quick strokes, which in primary forms readily gradated into the Phœnician alphabet and present a parallel element to the Greek, Hebrew, and Latin alphabets. The invention of writing, as Tylor remarks, "was the great movement by which mankind rose from barbarism to civilization." Or as Mulcaster puts it, it "proves the prop of remembrance, the executor of most affairs, the deliverer of secrets, the messenger of meanings, the inheritance of posterity, whereby they receive whatever is bequeathed to them, in law to live by, in letters to learn and enjoy."

On the subject of early handwriting and its development, Mr. Bernard Quaritch wrote *Palæography. Notes upon the History of Writing and the Medieval Art of Illumination* in 1894 (privately printed, London); and, especially on the *History of English Handwriting A.D. 700–1400,* there is the excellent article in the *Transactions* of the Bibliographical Society, London, Vol. V, pp. 109–142, 1901, and the same writer's *Calligraphy in the Middle Ages,* in *Bibliographia* (London, 1897), Vol. III, pp. 257–290.

In the Schools. — Turning to the actual teaching of writing in schools, in the Chantry Certificates (1545–1546) there are schools specifically called Writing Schools, at Bocking, Bromyard, and Montgomery. At Burgh-under-Staynsmore Free Grammar School in Westmoreland the statutes required the trustees "to teach the scholars to write, which is observed accordingly" (Leach, A. F., *English Schools at the Reformation*); such writing schools were probably the outcome of the old weakened traditions of the Monastic schools.

Writing in the Middle Ages was a specialistic art for the purpose of copying and illuminating manuscripts. It is therefore to the scriptoria of the monasteries we must look for accounts of its full development. The Abbey of St. Gall in the ninth century is particularly celebrated for the early Mss. written there. For a description of the division of labor in the copying of Mss. in the scriptoria see Drane, A. T., *Christian Schools and Scholars*, p. 172, and Gasquet, E.A., *The Old English Bible and other Essays*, p. 40 *et seqq.* The copy usually set for boys to imitate in learning to write in the monastic scriptorium is stated to have been the doggerel line introducing every letter of the alphabet: —

Adnexique globum Zephyrique Kanna secabunt.

It is not likely that there was any considerable amount of written work in the nature of exercises in the Middle Ages. The first book of exercises called the *Vulgaria*, consisting of sentences from Terence for translation into Latin, and vice versa, was printed in England in 1483, but this was probably for training in speaking rather than writing Latin. The same remark applies to Horman's *Vulgaria* in 1519. The first definite statement of preparatory work to be done in writing in England appears to be the *Englysche of Mancyne upon the four cardynale virtues* (see MANCINUS) in 1520, in which the writer advocates a method of double translation half a century before Ascham's *Scholemaster.* After the Renaissance, letter writing, theme writing, and the composition of orations, became a regular part of the school work and involved the use of writing, though it must be borne in mind that the ideal of Latin-speaking (*q.v.*) made writing of less importance relatively. When Latin-speaking was given up in schools (after 1660) writing became far more important as the basis of school work. Ascham's advocacy of written work in the *Scholemaster* was joined with high pride in his own calligraphy, and he wished to see written work much more prominent in school work than he found it. The "paper-books" systems which were required by the writing method had been suggested by Vives (*q.v.*). One reason which hindered the advance of writing in the Renaissance schools was the fact that the schoolmasters themselves were often very indifferent writers. The consequence was that up to the end of the first half of the seventeenth century it was usual for the grammar school boys to learn writing, not in the grammar school itself, but either (1) by going after school hours to a special writing school kept by a scrivener or by an arithmetic-teacher, or (2) for a peripatetic scrivener to visit the school for a month or six weeks at a time, each year, and the master to keep up the practice of the writing in the intervening periods. The former method prevailed in large towns, the latter in the country. One of the great grievances of the grammar school master, as Brinsley tells us, was that children had had no adequate preliminary teaching in reading and writing. Edmund Coote (*q.v.*) in the *English Schoolmaster* (1596), which was intended to help the elementary teacher, duly provided a copy in handwriting.

Treatises and Textbooks on Writing. — The first published English treatise on writing was prepared by a Frenchman, who lived and taught the art in London in 1571, viz., John de Beauchesne: *A booke containing divers sortes of hands as well the English as French secretarie with the Italian Roman Chancelry and Courts hands.* This, however, had been published in France earlier, *i.e.* in 1550. The first French writing book was published at Paris in 1529 by Geoffroy Tory of Bourges. Earlier still, viz., in 1522, in Italy, Ludovico Vicentino, a Venetian, had published a writing book at Rome. In Spain, the first written book was *Recopilacion subtilissima* of Juan de Yciar, at Saragossa. In France, Italy, and Spain there were, in the sixteenth century, great masters of the writing art (see *The Writing Books of the Sixteenth Century* in Transactions of the Bibliographical Society, Vol. III, 1876).

The teaching of writing in English schools was enjoined by statutes in the sixteenth century, and in the Westminster School it appears that boys were practiced in reading Latin Ms. writings. The first English teacher to treat educationally of writing was Mulcaster. Then Brinsley (1612) gave a full account of the practice of writing-teaching in schools (*Ludus literarius*, chapter IV), furnishing minute directions as to the best manner of making and mending the pens (which, of course, were quills) and referring to the difficulties of writing-teaching through the "often changing of hands" by masters employing different kinds of writing.

In 1654 (2d ed. 1659) Richard Lloyd (*q.v.*) in *The Schoolmaster's Auxiliaries to remove the Barbarians' Siege from Athens; advanced under* *two Guides; The first leading by Rule and Reason to read and write English dexterously,* etc., devotes a section to the rules of art in writing and gives the pedagogy of writing, where the best position of the body in writing is fully described, and the gradation of writing from copies laid down; and, like Brinsley, he describes the making of the pen. Charles Hoole in 1660, in the *New Discovery of the Old Art of Teaching School,* describes closely the method of teaching writing in country grammar schools and in city grammar schools. His own method was for twelve years past to send his boys at 11 o'clock and at 5 o'clock, *i.e.* after morning and afternoon school, to Mr. James Hodder, who had a private arithmetic school, and who had written on arithmetic, and also published a copy book. In his own school, Hoole had the little paper books ruled, in which pupils wrote their lessons "fair," and their translations and other exercises were done on loose papers, in Mr. Hodder's school, so that the writing school work was supported by the grammar school work until, Hoole says, they took the keenest pleasure in writing and "flourishing their exercises." In 1678 in his *Considerations concerning Free Schools,* Christopher Wase (*q.v.*) holds that writing "cannot be too universally propagated," and that in "petty schools" no small regard should be had to writing. This became the fact, owing to the wide establishment of charity schools at the beginning of the eighteenth century, and the position of writing as a permanent subject in the curriculum of elementary schools was finally settled.

One of the earliest teachers and best known specialists of writing in England was Peter Bales, who published his *Writing Schoolmaster* in 1590. One of the parts of this book was entitled *Brachygraphy,* containing rules to write "as fast as a man can speak." Two years earlier, however, Dr. Timothy Bright, a Cambridge physician, had published his *Characteric, or Art of Short, Swift, and Secret Writing,* and these were followed by the shorthand textbooks of John Willis, 1618; Willoughby, 1621; Henry Dix, 1633; Farthing, 1654; Ratcliff, 1656; Theophilus Metcalfe; Thomas Shelton, 1671.

Jeremiah Rich published his *Charactery* in 1646, and is said to have had "the approbation of both universities," and there were many other authors up to Aulay Macaulay in 1747. The prevalence of the shorthand textbooks is significant in its bearing upon the school requirement of church attendance on Sunday and the reproduction by the boys of the sermon. The national experiences of the persecution of the "Bloody" Mary made the reproduction of sermons of vital importance in the training of the Protestants to follow the ground and arguments of their own position against the Catholics. It is said that Philip Doddridge made the study of shorthand compulsory in his academy at Northampton.

Special Aspects of Writing.—Another development on which the writing masters prided themselves was "micrography" or writing in miniature. Peter Bales, again, excelled in this, and is reported to have written within the compass of a silver penny in Latin, the Lord's Prayer; the Creed; the Ten Commandments; a prayer to God; a prayer for Queen Elizabeth; his poesy; his name; and the full dates. Miniature writing was parallel to miniature painting. Bales in 1595 was challenged by Daniel Johnson to a writing contest for a golden pen worth £20, and won it. He had many pupils, "citizens and their children," and was called in, for specialistic services by politicians such as Walsingham and Hatton for deciphering and copying secret correspondence, etc.

A further offshoot from the work of the writing schoolmaster was that of the teaching of bookkeeping (*q.v.*). The development of trade and commerce with the sea and land discoveries of the Tudor period brought about instruction in commercial subjects and accounts largely for the development of writing-schoolmasters, on utilitarian, even more than on literary grounds. Had it been otherwise, the grammar schools would have been obliged by necessity to teach writing more systematically. Accounts-teaching became a recognized subject of the arithmetic and writing private schools. This subject was taught even in girls' schools, *e.g.* that of Mrs. Perwick (*q.v.*) in Hackney in 1643, and that of Mrs. Bathsua Makin (*q.v.*) at Tottenham High Cross in 1673. One of the most distinguished calligraphists at the beginning of the seventeenth century was a woman, Esther Inglis (anglicized form of Langlois, her father being a French Huguenot refugee to England after the massacre of St. Bartholomew's Day, 1572). In 1578 the father was master of the French school at Edinburgh. Manuscripts of Esther Inglis, beautiful in writing and in illuminations, are still extant in the Royal Libraries, Stockholm and Copenhagen, at Christ's College, Cambridge, in the Bodleian Library, Oxford, and in the British Museum Library, London.

Great Writing Masters.—Edward Cocker (1631–1675) is the best-known name of the old writing and arithmetic masters. He taught in St. Paul's Churchyard, London. His accuracy or pseudo-accuracy as an arithmetician has given rise to the phrase "According to Cocker." He was a man of ability in many directions and had an excellent library of Mss. and books. He is said to have been the first who published engraved *copy lines.* They quickly became popular, and in 1712 George Shelley, master of the writing school of Christ's Hospital, published *Sentences and Maxims in prose and verse containing a Collection of copies of all sorts put into alphabetical order for the use of writing schools.* Cocker wrote over twenty books of calligraphy. One of his chief works was the *Plumæ Triumphus* in 1657, "invented, written, and engraved," by himself with twenty-six plates, one for each year of his life, at that time. One of the plates shows Cocker himself, with laurel wreath, mounted on a steed, dragging a triumphal car with a pupil inside, and in front a bird of good omen, with a marvelous intricacy of flourishes.

The historian of writing, William Massey (died 1764), himself master of a boarding school for many years at Wandsworth in Surrey, states that Maso Finiguerra, a goldsmith of Florence, discovered in 1460 the plan of the rolling press, whereby engraving became general, and also states that the first English book with copper cuts was the *Birth of Mankind or the Woman's Book* in 1540. The writing books actually engraved in England, as we have seen, probably did not begin much before 1600. The most celebrated of all the writing masters for engraving work was George Bickham (died in 1769). His *Universal Penman*, 1743, contains a most comprehensive collection of all types of writing work by the best writing masters, and appeals to the gentleman and scholar as well as the man of business. Bickham's Collection of specimens makes the reader realize the high specialism of writing-masters. Moreover, he pleads for the educational value of the teaching, viz., "Writing proceeds from the eye to the hand. From the one we have size and proportion; from the other, boldness and freedom. For as the exactness of the eye fixes the heights and distances, so the motion of the joints and position of the hand determines the black and firm strokes to give the same inclination and likeness in the standing and turn of the letters." Engraving could hardly take writing higher than Bickham's work. The invention of lithographic printing, *c.* 1800 A.D., introduced a more certain and exact method for reproducing good copies of penmanship, but penmanship as a fine art is one of the educational disciplines which have degenerated since the seventeenth and eighteenth centuries.

Writing in School Statutes. — In connection with school teaching of writing, the statutes of the King's School, Durham (*c.* 1541) prescribe exercise in Greek, Roman, and secretary hands and the best boy in a form in the week's work was to "receive the pens and papers of all his fellows in that form." At St. Bee's School, 1583, writing was to be taught on Saturdays and half holidays; at Houghton le Spring (Durham), founded 1582, "on playing days and after supper." At Camberwell Grammar School (1615), writing in Secretary and Roman hands was to be examined quarterly, and the boys' best performances to be kept that "all posterity may see how much and wherein they excell or come behind their predecessors." Prizes of money were to be given to the twelve best boys on the quarter's work. At Lewisham Grammar School in 1652, the founder wrote in the statutes "to draw in love the parents the more willingly to send children to the school, a writing master be appointed at £11 per annum, and at the public disputations, the best scholars were to have *silver pens* awarded them. The same provision for prizes of silver pens was made at Sandwich in 1580 and at Tonbridge in 1619, though these were awarded for debating in the schools (*q.v.*). In 1782, at Penrith, a benefactor provided a silver pen for the greatest proficient in writing.

The most conspicuous endowment for a writing school after the Renaissance is that at Christ's Hospital, founded by Dame Ramsay in 1577 and endowed by her will in 1596, with £20 a year. In 1581 the court of Christ's Hospital ordered that every Sunday two of the best learned children should "pen the sermons" at Paul's Cross. In 1626, Edward Alleyn in founding Dulwich College placed writing with grammar, as obligatory subjects, and in the statutes of Chigwell, 1629, it was required that the second schoolmaster should "write fair Secretary and Roman Hands" and teach writing to the children. In the earlier part of the seventeenth century, writing if taught at all in the grammar schools was regarded as an extra and paid for by a special fee, but the grammar schools protested against it being regarded as a school subject. In the eighteenth century writing had become an elementary school subject, and good handwriting learned at a special school was something of a class distinction. In the nineteenth century, the multiplication of school subjects tended to relegate writing to the position of an instrument of instruction and to the disregard of methods of teaching so long as legible writing was secured, but there appears now to be a reaction toward a reconsideration of the pedagogical significance of the teaching of handwriting. F. W.

Psychology of. — Writing may be regarded as one form of language. That is, it serves as a means for the expression and communication of thought. From the psychological standpoint writing presents two problems. The first concerns the formation of the motor habit by which writing is produced, and the second the relation of the writing movement to the ideas which are to be expressed.

The motor habit or coördination, which makes up the external side of writing, is very complex. This may be seen from an examination of the large number of individual movements of which it is composed. The eyes are focused upon the writing and follow it in greater or less detail. There are incipient movements of articulation as the words which are being written are inwardly pronounced. The body must be held in such a position that the arm can move freely and comfortably.

The left hand is engaged in holding and shifting the paper. Of the right hand there is a movement about every joint. There is movement about the shoulder joint when the hand moves along the line or when the arm joins in the formation of the letters. The same is true of the elbow joint. When the hand turns over so as to bring the palm down toward the paper in the movement of pronation, the two bones of the forearm twist upon each other, and there is movement at the elbow and wrist joints. A rotation of the wrist to the right often accompanies the progress from letter to letter within the word and there is a movement to the left between the words. The finger movements involve movement about at least two joints of the first and second fingers and all the joints of the thumb.

These various movements are produced by the action of a large number of muscles and nerve centers. These muscles are located mainly in the shoulder and forearm. It is sometimes mistakenly supposed that the finger movements are produced by muscles in the fingers. Finger movements are produced mainly by the contraction of muscles in the forearm.

The large number of movements necessary for writing partly explains its difficulty. A further explanation is to be found in the fact that these individual movements must be combined in a way which is not instinctive. The instinctive movement of the hand is grasping and in this act the fingers all move alike. In writing, on the other hand, the third and fourth fingers remain in a fixed position and support the hand, while the first and second fingers carry on the writing movement. Again the thumb does not naturally work together smoothly with the fingers. The fingers are operated by one muscle and nerve group and the thumb by another. When one learns to write, part of the finger group is separated from the rest and is joined to the thumb group. Not only is the simultaneous combination of movements one which is not instinctive, but the order in which they follow one another is not part of an individual's natural equipment. The sequence of movements must be learned as well as the combination. If any movement is made out of time, it causes an irregularity in the total movement and hence in the stroke of the letter. The same principle holds true of the relative strength of the various component movements. If the thumb, for example, is contracted too vigorously on a downward stroke, the stroke deviates to the right.

From these facts something of the complexity of the writing movement may be seen. The means through which the separate muscles can be made to work in harmony in a complex movement is found in the nervous system. The development of the writing movement, then, means the formation of a system of connections in the nervous system. The various individual movements must be bound together into harmonious action. This is done by the formation of a motor writing center in the brain — a center which especially governs the writing movement.

We have so far spoken only of the external movement. This develops of course only under the guidance of sensations and perceptions. There must be a perception of the movement or the form which we wish to reproduce and in addition certain sensations or perceptions which make us aware how far we are attaining our purpose. Such sensations or perceptions are comprised under the term "writing controls." The primary writing control is visual. In the early period of learning, to make graphic movements, the child merely copies hand movements. He next copies outline figures. In this period drawing and writing are one. As the form of the letters becomes fixed in memory the visual image is used instead of an external copy, both to initiate the movement and to test its correctness. As the writing habit develops the visual control becomes less prominent. In developed writing the movement is not preceded by a clear image of the letters nor are the letters inspected in detail after they are made. Visual control is here chiefly concerned with outstanding features, such as alignment, spacing, and slant. From the early development of the coördination another control has been forming, based upon sensations of movement and pressure. These together are sufficient in developed writing to enable us to know, without seeing the writing, whether or not we have written what we intended. They probably also become of chief importance in initiating the writing movement. This is indicated by the fact that there is a pathological condition in which, though vision is unimpaired and the control of hand movements is present, the ability to write words is lost.

It is evident that learning to write is preceded by a recognition of the form of the letters. The child must hold in mind an image, even if very imperfect and fleeting, of what he is to reproduce. The reproduction of the letters leads to the perfection of this first crude recognition. In recognition sufficient for reading it is only necessary that the salient features be attended to, but for writing the letter must be scrutinized in every part. This recognition may be very advantageously supplemented by seeing somebody else write the letters, that is, by the perception of the hand movements by which the letters are made. There is an instinctive connection between the sight of movements and their reproduction and, further, the letter is by this means analyzed for the child.

The extent to which correctness of form is developed or maintained determines the degree of legibility of the writing. Legibility, then, depends upon the dominance of the visual control until such time as the motor habit has been firmly fixed in the right channels. Legibility may again diminish through a disorganization of the motor habit. This often happens, for example, in the case of college students who take lecture notes very rapidly and in bad writing positions. In such cases, a return to the visual control is necessary to the recovery of legibility. Legibility in order to be permanent must be developed under the conditions in which later writing will occur.

The ease and rapidity of writing depends upon the harmonious coöperation of the component movements, and this in turn depends upon the formation of corresponding nervous connections. In the early stages of the habit there is a diffusion or scattering of nervous impulses to muscles in all parts of the body. Hence the familiar picture of the child sitting in a cramped position, twisting his feet, contorting his face, and clenching the fist which is not engaged in writing. As the habit becomes perfected, those nervous channels which lead to the muscles engaged in the writing movement become more permeable and the nervous impulse becomes more and more confined to these channels. At the same time an orderly succession of impulses corresponding to the movement to be made becomes established. These changes produce an increase in the accuracy, speed, and ease of the movement.

If we examine by means of measuring devices the rate of the writing movement, we find not only that it increases with progress in skill but also that the rate of certain parts of the letters increases more than the rate of other parts. In the beginning the rate of movement throughout the different parts of the letters is more even than it is later. In the writing of adults the straighter strokes are made very rapidly and, where there is a change in direction, the stroke is relatively slow. At the same time the rhythm increases greatly, — that is, the various strokes, even though of widely different length, are made in approximately the same time. The interpretation of these facts seems to be found in the fact that in adult writing the attention is withdrawn from the details of the form and movement. We may think of the child's attention as being fixed continuously upon the course of the stroke. As the habit develops, attention is given to the letter or word as a whole and to its meaning more than to its details. In other words, the writing movement becomes relatively automatic. It is probable that with this change the movement comes more under the control of mechanical factors, one of which is the inertia incident to changing the direction of the movement. At the same time a general aspect of the consciousness of movement, the sense of rhythm, becomes more prominent.

We have so far treated of writing merely as a form of movement. This movement has its significance only as a form of language expression. The relation of writing to speech appears from a study of the history of its development. In the evolution of the race writing first developed independently of speech. It existed in its earliest stage in the form of picture writing. The primitive man then could refer to an object by a word or by drawing a picture of it, but the drawing and the word had no direct relationship to each other. But there were certain kinds of objects which it was difficult to represent by drawing pictures, for example, persons or places, such as are represented in speech by proper names. The method devised to meet this difficulty was to use the picture of an object which had a name of similar sound. This was the first step in directly connecting speech and writing by using written signs to represent sounds instead of objects. The development of writing had also a reflex influence on speech by leading to an analysis of its constituent sounds.

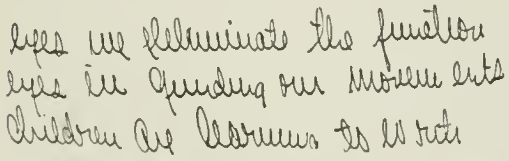
The relation of speech and writing are similar to this in the development of the child. He first learns to understand and to use vocal speech, and this is well developed when he comes to write. His first efforts to write, however, have little relation to speech but consist in copying letters or words as visual forms. If writing is carried on in connection with reading, the letters he writes will very soon mean more than merely visual forms — they will stand for sounds and for the meanings for which these sounds stand. Writing becomes grafted on, so to speak, to speech, and the relation is so close that a disturbance of the speech function which impairs the understanding of words disturbs writing also.

Pedagogy and Hygiene. — The question in the pedagogy of writing which has perhaps aroused the most discussion and caused the most divergence in opinion and practice is the question of slant. The agitation first arose about 1875 as a result of investigations into the hygiene of writing. Before this a slant of about 38° from the vertical was used almost universally. Certain German and French medical men discovered about this time a very large number of cases of spinal curvature and eye trouble among school children and attributed the trouble to the position taken in writing. This position, as directed for instance in the Spencerian System, consisted in sitting with the right side toward the desk, with the right elbow resting upon it and the left arm hanging from the shoulder, except that the hand rested upon the paper. As a consequence the right shoulder was raised higher than the left and the head was inclined to the left, causing lateral curvature of the spine in the back and the neck. Further, the left eye in this position was farther from the writing than the right eye, causing unequal accommodation (*q.v.*) and hence eye strain.

The conditions which are necessary in order to overcome these evils are well summarized in a series of recommendations made by the Society of Public Medicine of France in 1879. It recommends: (1) that the pupil sit with the weight equally distributed, the shoulders parallel to the edge of the desk, and the back erect; (2) that it is preferable that he do not rest his elbows on the desk, but that, if he does, they should rest upon it equally; (3) that he hold the paper with the left hand; (4) that vertical writing be adopted, but, if not, that the paper be inclined to the left through the angle by which the writing inclines from the vertical. The objections on the score of hygiene were as serious as against the position which was formerly used in writing with a slant. They have been almost entirely overcome, however, by an adoption of the first, third, and latter part of the fourth of the recommendations of the French Society, without the necessity of using vertical writing.

The other argument for vertical writing is that it is more legible than writing which has a slant. The difference, however, is not great, provided the writing does not slant too much. Moreover, vertical writing tends strongly to lose its advantage on this score when it becomes rapid, since the connecting strokes tend to become rounded and the different letters to lose their distinctive marks. See, for instance, the word *eliminate* in the accompanying figure.

FIG. 1.



eyes we eliminate the function
eyes in guiding our movements
children are learning to write

The chief arguments for slant are based on the greater ease and rapidity which this style of writing makes possible. In the first place, writing is more rapid when there is not a radical difference in direction between the main downward strokes of the letters and the upward or the connecting strokes. In the second place, ease of movement requires that the hand may be moved freely along the line without drawing the elbow back. In order to do this the paper must be tilted to the left until the line of writing is nearly perpendicular to the forearm. (See Fig. 2.) The natural downward stroke of the letter comes, as the French Society held, about perpendicular to the edge of the desk, however the paper is held. The writing will then slant by as much as the paper is tilted from the vertical (in the figure, 30°). With the paper thus tilted there is a tendency to turn the head to the left, but this tendency may in some measure be overcome.

A second important pedagogical question is in regard to the best form of writing movement, — arm movement or combined finger and arm movement. Present practice strongly favors arm movement. The main arguments for the arm movement are first, that it does not use the smaller "accessory" muscles, and second, that the larger muscles are more tireless so that the movement is easier and more rapid. The first argument is invalidated by the fact that the new-born infant uses the same muscles as are used in writing in the instinctive act of grasping. It is rather the delicacy, complexity, and non-instinctive character of the writing movement which makes it so difficult. The arm movement does not avoid these causes of difficulty except in very large writing with chalk or crayon, and even then the difficulty is not entirely avoided. It is probably true that arm movement is less fatiguing than finger movement, but this is to be offset by the fact that the fingers are much better instruments of delicate adjustment than the arm; by the fact that the large majority of those who are taught the arm movement do use a considerable amount of finger movement; and by the fact that it is necessary to overcome a much greater inertia to move the whole arm in making the finer strokes of the letters than to use the much lighter and more easily moved fingers. The movement of the arm and wrist should in any case coöperate freely with the fingers in carrying the hand along from letter to letter and from word to word, and probably in making the larger letters, and some emphasis on this element is valuable to overcome the habit of cramping the hand which the child so readily falls into.

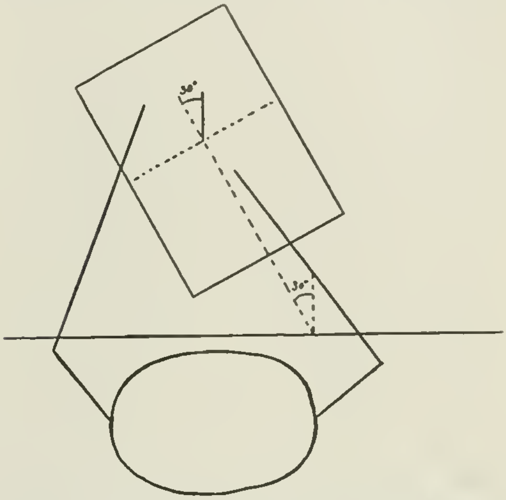


FIG. 2. — Position at the desk, position of paper, and direction of slant with reference to the paper and the desk.

A third question of method deals with the relative advantage of training two or more different sorts of activity together or separately. The first type of procedure is called the analytic, and the second the synthetic method. The question may be raised first as to whether it is better to aim at the production of correct form of letters and the acquisition of good habits of movement at the same time, or to emphasize first one of these aims and then the other. The advantages urged in favor of the analytic method (aiming at both sorts of excellence together) is economy. It is not necessary to do the same thing twice, now with one aim in mind and now another. On the other hand, the synthetic method is likely to be more thorough because of the greater concentration of attention on a single aim. These are the general considerations wherever this question of method comes up. In this case, the separate treatment (synthetic method) is probably better. The question still remains whether form or movement should be emphasized first. The arm movement advocates hold that, if good habits of movement are early developed, correct form will come as a consequence. For the contrary practice it is to be said that the child's capacity for manual skill is very limited to the age of nine or ten and that the years before this time might perhaps be best employed in fixing in mind the forms of the letters. The question has not been satisfactorily settled.

Another form of this general question of method might be stated thus: Is it better to give drill first upon the separate elements of the letters and gradually build up the letters and words by putting these together (synthetic method) or should the child write whole letters or even words from the beginning (analytic method)? The extreme form of the synthetic method is no longer generally used in the United States. It has the disadvantage, besides being uneconomical, of failing to arouse interest. The opposing method of beginning with whole words, which is now widely used, is in danger of neglecting good form, and this must be guarded against by laying stress upon the analysis of the writing.

A similar alternative exists in relation to movement. Is it better to train arm and finger movement together and from the start, or to begin with one and introduce the other later? This question, theoretically, does not arise, if one holds exclusively to arm movement, but practically it does because the vast majority of those trained to arm movement use finger movement to some extent. The objection to the use of the complete movement from the start lies in its complexity and difficulty. It is usually agreed that arm movement may well be used at the blackboard from the start, but this does not greatly influence writing at the desk. A further argument for beginning with arm movement at the desk is that it is the more difficult for the child to acquire, whereas the finger movement will come with little effort. On the other hand, this fact may be presented as a reason for putting off the more difficult or less natural part of the movement until the child is more mature. In any case practice is required not merely on the separate elements of the movement but also on their combination. Much attention is now being given to the investigation of these and similar questions of the pedagogy of writing by the scientific testing of the writing product. The study of writing thus takes a place in the foremost rank of the methods of scientific supervision.

A feature of the pedagogy of writing which requires emphasis is drill. In order that the motor habit may possess stability and the movement be rapid and easy, there must be frequent and continued repetitions of the same forms and movements. To this end, writing must be treated as an independent subject and not as incidental to some other form of training. Moreover, in order that improvement may be made, there must be close inspection and criticism of results by the pupil with reference to some standard of attainment.

A special device of drill which is instrumental in the organization of the coördination is the use of rhythm. As developed writing is characterized by a higher degree of rhythm than undeveloped, so the imposition of a set rhythm by marking time — counting, using a metronome, etc. — hastens development. The caution to be kept in mind is that the choice of too rapid a rhythm will develop speed at the expense of accuracy of form. On the other hand, too slow a rhythm will induce lazy writing and perhaps lead to a disorganizaton of the habit, when conditions require more rapid writing later on. There are individual differences as to the most favorable rate. Some are not capable of maintaining the average rate for their age and a few can exceed it. These may be dealt with individually.

The hygiene of writing has been already touched upon in discussing slant. Briefly, the pupil should face the desk, sit squarely on the seat with both feet on the floor, should rest both elbows equally on the desk and hold the head erect. The seat should project two or three inches under the desk so that the child can sit fairly erect and still be close to the desk, and should be at such a height that the elbows reach the desk but are not spread more than two or three inches from the body. (See DESKS AND SEATS.) Hygiene of the eyes demands that the paper be placed directly before the pupil; that the eyes be kept about a foot away from the paper; that the source of light be toward the left and diffused, so as not to be reflected into the eyes by the paper; that the surface of the paper be not shiny, and that the ink or pencil mark be not pale or indistinct. (See EYE, HYGIENE OF THE; LIGHTING OF THE SCHOOLROOM.) In order to facilitate ease of movement and avoid cramp several recommendations are to be made. At the beginning writing materials which minimize friction, such as crayon, should be used.

When the pen is used it should have a smooth point which does not catch easily in the paper. The surface of the paper should be hard. A fairly large penholder, which has a rough surface should be used. Cork is one of the best materials for this purpose. These precautions will do much to prevent the cramping of the hand. F. N. F.

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WRITING SCHOOLS. — See Writing, History of the Teaching of.

WURTTEMBERG. — See Germany, Education in.

WURZBURG, ROYAL BAVARIAN JULIUS-MAXIMILIAN-UNIVERSITY OF. — Established in the year 1582 by Bishop Julius Echter of Mespelbrunn. A previous attempt to found an institution of higher learning in this ancient and interesting town had been made by Bishop John von Egloffstein in 1402. The bull of Pope Boniface IX was dated Dec. 10, 1402, but although instruction was begun — the University was modeled after the University of Bologna — lack of endowment and internal strife brought about its dissolution within a decade. The bull for the second venture was received on March 28, 1575, and the imperial sanction was secured in May, but instruction was not begun until seven years later, and in the same year the erection of a university building and a university church was begun. A hospital, the famous Julius Hospital, was erected in the city at about the same time, and a close association with the medical school of the University was soon established. The University was founded as a Catholic institution, and the chairs in theology and philosophy were occupied by the Jesuit order until its dissolution in 1773. Inasmuch as most of the existing German universities were Protestant institutions, Würzburg rapidly became a popular center for Catholic students. Like most of the other German universities, Würzburg suffered greatly during the Thirty Years' War, and during the occupation of the town by the Swedes the institution was closed for several years. A complete reorganization took place when Würzburg was united with Bavaria at the beginning of the nineteenth century; the institution was now shorn of its clerical character and received its present title. The faculty of medicine has been for some time, and still is, one of the best in Germany. The first medical institute to be established (1724) was the so-called anatomical theater (at the Julius Hospital), which received a home of its own in 1853, but moved fifty years later into a building better adapted to its needs. In 1878 a pathological institute was founded, and in 1887 the physiological institute moved into a building of its own. Other medical institutes and clinics were established from time to time, until to-day there are few German universities better equipped in this direction. A new main building for the University was finished in 1896, the library and several collections being kept in the old building. A botanical garden was established in connection with the garden of the Julius Hospital as early as 1696. Connected with the University are an excellent mineralogical and geological collection and a (Von Wagner) museum of art. The library contains about 380,000 volumes, many of which became the property of the University at the time of the secularization of the monasteries in 1803. The annual budget amounts to approximately $275,000. During the winter semester of 1911–1912 there were 1583 students in attendance, including 67 male, and 58 female auditors. Of the 1458 matriculated students more than half were enrolled in medicine (including dentistry and pharmacy), viz. 741; 346 were registered in philosophy (including philosophical-historical and mathematical-natural science sections), 270 in law and political science, and 101 in Catholic theology. The faculty consists of about 100 instructors, including 22 docents. Among prominent former teachers may be mentioned Hufeland in jurisprudence, Siebold in anatomy, Schönlein in medicine, Heine, inventor of the osteotome, Döllinger, founder of the zoötomical-physiological school, Virchow in pathology, Fick in physiology, Röntgen in physics, Wagner in chemical technology, Wislicenus in chemistry, Sachs in botany, Friedrich Schelling in philosophy.

Würzburg is the seat of the Historical Society of Lower Franconia and Aschaffenburg, founded in 1831, and of the Society for Franconian History, founded in 1905.

R. T., Jr.

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WYCLIFFE COLLEGE, TORONTO, CANADA. — Founded by members of the Church of England in 1877 as the Protestant Episcopal Divinity School. The College was incorporated in 1879. In 1884 the College was affiliated to the University of Toronto and in 1889 was federated and made a constituent part of that University. The courses in arts at the University are open to students of Wycliffe College, which confines itself to theological training, leading up to the examinations for the degrees of B.D. and D.D., set by the Board of Examiners of the Provincial Synod. About ninety students are annually enrolled.

WYKEHAM, WILLIAM OF (1323–1404). — Bishop of Winchester, Lord Chancellor and founder of colleges, affords a striking example of the *carrière ouverte aux talents*, which the profession of clerk in the Middle Ages opened to the middle classes. According to the only really contemporary authority, the *Life* written by Robert Heete about 1430, he was born at Wickham, Hants, in 1323 or 1324. Some patrons, unnamed, paid for his education at Winchester in the primitive sciences, (grammar, logic, and philosophy) beyond which he never passed. On leaving school Wykeham became "under-notary (vice tabellio) to the constable of Winchester Castle," Robert of Popham. Later he was transferred to the King's Court, and on May 10, 1356, made clerk of the King's works in the manors of Henley and Easthampstead; and in October he was made surveyor of the works of Windsor Castle, with the same duties as at Henley.

This appointment has been supposed to mark his becoming architect to Windsor Castle. But there is no suggestion that he was an architect before the anecdote told by Archbishop Parker, 150 years afterwards, of his building the Round Tower, and inscribing on it: *Hoc fecit Wykeham*, which, when brought to the King's notice, would have cost him his place had he not explained that it meant, not "Wykeham made this," but "This made Wykeham." The Round Tower was, however, a Norman work. Wykeham was paymaster and manager, not architect. In 1357 he was presented to the rectory of Pulham, worth £53 a year — one of the richest livings in Norfolk. This was the subject of a contest in the papal court, and though Wykeham obtained a papal grant of it on July 3, 1358, on April 16, 1359, he was given a pension of £20 a year by the King until he could get peaceful possession. The grant of ecclesiastical benefices was the usual method in those days of paying the King's clerks. The measure of Wykeham's usefulness as a clerk may be gauged by the number of benefices heaped on him in addition to his secular offices. In June, 1359, when the French sacked Winchelsea, he was made surveyor of Dover, Guilford, and other southern castles. Next year he was one of the negotiators of the Peace of Bretigny. Between April 16, 1359, when he was made a canon of Lichfield cathedral and 1362 when he was made a canon of St. Patrick's, Dublin, he was given nineteen canonries in as many cathedrals and collegiate churches, including Lincoln, Salisbury, and St. Paul's, London, besides the deanery of St. Martin's-le-Grand, London, the archdeaconries of Northampton and Lincoln and a rectory in Cornwall. On May 5, 1364, he became keeper of the Privy Seal and according to Froissart (i. 248) "reigned" in England and was practically Prime Minister. On the death of the Treasurer of England, William of Edyndon, bishop of Winchester, Wykeham was named by the king for the bishopric and presented to it by papal bull on July 4, 1367. On September 17, he became Lord High Chancellor. As chief minister he was responsible for the disastrous war with France which was renewed in June, 1368, and resigned after the attacks in Parliament in 1371, to be succeeded by the first lay ministry since the Conquest. After a series of somewhat obscure struggles with John of Gaunt, Wykeham was in 1376 impeached, convicted (wrongfully) of tampering with the rolls of chancery, and declared liable to a fine of £640,000, and his episcopal revenue confiscated. This incident reveals Wykeham to us as already playing the part of an educational founder. For it is recorded that when he "broke up household" he also sent home the seventy scholars whom he was maintaining at Oxford. There is evidence that from the time he became bishop in 1367 he had also begun to maintain seventy scholars at Winchester and he caused to be entered in his episcopal register the contract which he made on Sept. 1, 1373, with Master Richard of Herton, grammarian, to teach for ten years the poor scholars whom he maintained at Winchester, the art of grammar. He had already begun to buy land at Oxford for his college there. But nothing more was done till after the accession of Richard II in September, 1377, when Wykeham was granted a full pardon and his bishopric was restored. Then on June 1, 1378, he obtained a bull from Pope Urban VI, enabling him to appropriate Downton Rectory, Wilts, for "seventy poor scholars clerks to live collegewise and study in grammaticals near the city of Winchester." Under a similar Papal bull, on May 26, 1379, Wykeham actually founded "Seinte Marie College of Wynchester in Oxenford," for a warden and seventy scholars to study theology, canon and civil law, and arts, by far the largest and best endowed university college in England, or in the world, at that time. The only one which approached it in magnificence was the royal college of Navarre at Paris, founded by Queen Joan of France and Navarre in 1304, but that contained only twenty theologians and thirty artists, besides twenty grammar boys, who were represented in Wykeham's foundation by the seventy grammar boys in the college at Winchester. This college was formally founded only on October 6, 1382. The Oxford College then, and ever since, known as the "New College" entered on its new buildings, which occupied the site of six or seven old "halls" on April 14, 1386. The Winchester College buildings were not inhabited till March 25, 1394. The delay in completion was due to political troubles, during which from May 3, 1389, to Sept. 27, 1391, Wykeham became a second time Chancellor. He then retired from politics during Richard II's unconstitutional rule of arbitrary power. He emerged to devote some of his enormous wealth to financing Henry IV at the beginning of his reign. The rest of it was largely spent in rebuilding in the "perpendicular" style the Norman hall of Winchester Cathedral. In it in the beautiful chantry chapel, built by him on the spot where as a boy he attended early mass at St. Mary's altar, he was buried, and a fine effigy on his tomb, no doubt made in his lifetime, still shows us his portrait. He died at the age of eighty on Sept. 27, 1404, leaving behind a college at Oxford which served as a model for all subsequent colleges there and at Cambridge up to the Reformation, and in his college at Winchester the Public School which still serves as a model for all the great Public Schools of England, — no slight achievement for a poor middle-class clerk. A. F. L.

See Winchester College.

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WYOMING, STATE OF. — Organized as a territory by Congress in 1868, and admitted to the Union in 1890, as the forty-third state. It is located in the Rocky Mountain section of states, and has a land area of 97,594 square miles. In size Wyoming is about as large as New York, Pennsylvania, and Connecticut combined. For administrative purposes the state is divided into fourteen counties, and these in turn into school districts. In 1910 Wyoming had a total population of 145,965, and a density of population of 1.5 persons per square mile.

Educational History. — The first legislature, in 1869, enacted the first school law for the territory. This law laid down the main lines of the school system, and these have persisted up to very recent years. The law provided for the organization of school districts and schools, and for territorial, county, and district forms of organization. The territorial auditor was made *ex officio* a territorial superintendent of schools, and was directed to see that schools were organized, and the system put into operation. The district boards were to care for the schools, keep records, appoint teachers, and make an annual report to the county superintendent, who was in turn to report to the territorial auditor. County taxation, up to two mills, was authorized, with district taxation for school buildings. Schools of higher grade were also permitted, if the district trustees and county superintendent agreed on their establishment. In 1871 the territorial superintendency was abolished, and the county superintendents were ordered to report to the Governor, but in 1873 the superintendency was restored, and the state librarian was made *ex officio* superintendent. In 1873, also, all previous laws were repealed, and a new law substituted, but with few changes in organization, and only minor changes were made during the two decades following. This was in large part due to the sparse population and the slow development of the territory, and, the district form of organization being well suited to the primitive conditions, there was little need for additional legislation. By 1870 only nine schools had been established, and only four of these were public schools. Only fifteen teachers were employed in all, and but 364 pupils enrolled. Even in 1880, when the separate office of Territorial Superintendent of Public Instruction was created, there were but thirty-six schools, fifty teachers, and about 2000 school children enrolled. After about 1885 conditions began to improve more rapidly, and by 1890, when statehood was attained, there were 282 schools, 306 teachers, and 7875 children enrolled. In 1886 the University of Wyoming was created, and opened the following year. In 1887 high schools were first authorized. In 1888 schoolhouse bonds were authorized, and the city and county superintendents of the territory were directed to meet and to adopt a uniform series of textbooks for use in the schools.

The new state constitution of 1890 made definite provision for the maintenance of a state school system. The legislature was directed to establish and maintain "a complete and uniform system of public instruction, embracing free elementary schools of every needed kind and grade, a university, and such other institutions as may be necessary"; the different educational grants were specified and the funds derived were declared permanent; and a three months' term was required; aid to any private or sectarian school or institution was forever prohibited; free schools, taxation for education, and compulsory education were provided for; discriminations on the basis of race, color, or sex, and sectarian tests and instruction were forbidden; a State Superintendent of Public Instruction was provided for, and he was intrusted with the general supervision of the schools of the state, subject to direction by the legislature; an *ex officio* Board of Land Commissioners was created, to lease and sell the educational lands; and the previous establishment of the University of Wyoming was confirmed, and its maintenance and support was directed. But little educational legislation followed the coming of statehood, the previous school system continuing. A number of laws were presented to the legislatures of 1891 and 1893, but these failed of enactment. The State Teachers' Association held its first meeting in 1891. In 1899, after nearly ten years of recommendation and urging, some important educational legislation was secured. A free textbook law was enacted; a State Board of Examiners was created; and the teachers' certificate law was revised and improved. The questions used in county examinations were made uniform for the state; state professional certificates were established; and graduates of the University and of the state normal schools were to be certificated on their diplomas. In 1903 the census and apportionment laws were revised. In 1905 a detailed union district high school organization law was enacted, and the office of Public Law Commissioner was created. In 1907 a county library law was passed; a compulsory education law was enacted; and the examination and certification of teachers was taken from the counties and placed under the control of the State Board of Examiners. In 1909 the institute law was revised, and the appropriations for institutes were increased; the certification law was further revised; and fees for teachers' examinations were instituted. In 1911 the taxation and apportionment laws were again revised, and a few minor changes were made in other laws.

Present School System. — At the head of the present state school system of Wyoming is a State Superintendent of Public Instruction, elected by the people for four-year terms. Women are eligible for all elective offices in the state. The Superintendent has general supervision of the school system of the state, and sees that it is carried into uniform operation. To accomplish this he has power to make rules and regulations, which have the effect of laws until overruled by some court. He (or she) distributes the school fund to the counties; decides appeals from the decisions of the county superintendents; determines what textbooks may be bought by the districts, and prepares the contract forms; appoints the State Board of Examiners, and issues all teachers' certificates, on their recommendation; and makes a biennial report to the Governor. He is *ex officio* a member of the Board of Trustees for the University of Wyoming; of the State Board of Charities and Reform; and of the Board of School Land Commissioners. The State Board of School Land Commissioners has the direction, control, leasing, and sale of all the different lands granted to the state for educational or other purposes.

In each county is a County Superintendent of Schools, elected by the people for two-year terms. Women are eligible for this office, also, and most of the superintendents are women. It is the duty of the county superintendent to subdivide the county into school districts, and to alter them, as necessity requires; to have general supervision of the schools, with power to dismiss incompetent teachers; to hear and to decide appeals from the decisions of the district trustees; to hold an annual county teachers' institute, of at least four days' duration; to see that the district school reports are made; to unite with the District School Board in determining whether or not individual districts may maintain a high school, or a separate school for colored children; to act as agent for the State Board of Examiners, in giving examinations for teachers' certificates; and to make a detailed annual report to the State Superintendent.

Each county is divided into a number of school districts (303 in the fourteen counties in 1910), for each of which a board of three trustees is elected, one each year, and for three-year terms. Together the three trustees constitute a board of directors for the school district. When the district comes to have a population of 1000 or over, the number of trustees is increased to six. The annual district school meeting is still a feature of the Wyoming system, and is held annually in May. The meeting elects its own chairman and secretary; may adopt rules of order and procedure; hears the reports and estimates of needs from the Board of School Directors; determines the number of schools, and the length of term (in excess of three months) to be taught; votes the district taxes for maintenance and repairs, up to three and one half mills, and, on thirty days' notice, may vote up to five mills; may vote $100 to procure a district library; may direct the location of the school, or the sale of property; and also elects, by ballot, trustees to fill any vacancy. The Board of Directors carries out all votes of the school district meeting; makes all contracts; audits and pays all claims; may appoint a visiting committee, from its own number, to visit the school monthly, to aid the teacher, and to promote the welfare of the school; employs all teachers; sees that an annual school census is taken, and reported to the county superintendent; selects the textbooks to be used, and provides them free to pupils; and makes, through its clerk, an annual report to the county superintendent.

School Support. — At the time of the admission of the state, Congress granted the sixteenth and thirty-sixth sections in each township to the state for schools, and placed a minimum sale price of $10 an acre on these lands. The state thus received 3,480,281 acres, two thirds of which are under lease. But little of the land has as yet been sold. The total income from the lands and the permanent fund in 1910 was $150,213, but, there being so few children in the state, this made an apportionment of $5.04 for each census (6–21) child in the state. This constitutes all of the state aid for elementary and secondary education, there being as yet no state school tax. The chief dependence of the schools is on district taxation, from which source 75 per cent of the income is derived. A county tax for schools is levied, but this must not exceed six tenths of a mill for school maintenance, or one fourth of a mill for county libraries; and district taxation must not exceed three and one half mills, unless authorized by the voters, in which case it may go up to five mills.

Teachers and Training. — The state employed 1109 teachers in 1910, 141 of whom were males. Fifty-seven of these were in high schools, three in kindergartens, and ten in town schools for the colored race. For the training of future teachers a normal department is maintained in the University of Wyoming, and graduates of normal schools and colleges in other states, as well as those holding certificates from other states equal to Wyoming first- or second-grade certificates, may be certificated. A state board of three examiners, appointed by the State Superintendent from among the school principals, city and county superintendents, and the faculty of the State University, prepare all questions, mark all papers, make rules and regulations for the conduct of examinations, and recommend all successful candidates, or persons holding the required credentials, to the State Superintendent for certification. The certificates granted ascend in a well-worked-out graded series, and the state professional certificates deserve special comment. All certificates are valid in any county in the state. The examiners are also required to recommend, each year, a series of reading circle books, and the renewal of certificates involves the reading of and an examination upon these books. An annual county teachers' institute, of at least four days' duration, is held in each county. Differences in salaries based on sex or religion are forbidden.

Educational Conditions. — The sparse population makes the school system largely a rural one. Twenty-nine and six tenths per cent of the total population is found in seven cities, all located along the line of the Union Pacific Railway, while the remaining 70.4 per cent are widely scattered over the state. Outside of a few cities and towns, the schools are all one-room rural schools, with small enrollments. The average for the state, cities included, was but twenty-two pupils enrolled per teacher. The ten schools for colored children contained 4 per cent of the total enrollment. Only 5 per cent of the school children were foreign born. The high altitude, the lack of intensive agriculture, the lack of utilized resources, and the small population naturally preclude the possibility of a highly developed school system. A good library law provides for a free library in each county, and school district libraries are also well developed.

Secondary Education. — The new high school law of 1905, providing for union district and county high schools, with a special high school tax levy up to two mills for annual maintenance, has stimulated somewhat the development of such schools. A high school is now found in each county, usually at the county seat. In 1905 there were fifteen high schools in the state, with 771 in attendance, while for 1910, twenty-three high schools, with fifty-seven teachers and 1412 students, are reported. The course of study in the high schools must prepare for admission to the State University, where fifteen units are required for entrance.

Higher and Special Institutions. — The University of Wyoming (*q.v.*), at Laramie, not only stands at the head of the public school system of the state, but is the only institution of collegiate rank in the state. The state maintains no public institutions for the education of special classes of children.

E. P. C.

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WYOMING, UNIVERSITY OF, LARAMIE, WYO. — Established by the ninth territorial legislature, on March 4, 1886, and opened on Sept. 6, 1887. While there have been prolonged contests to divide the higher educational institutions and parcel them out to different parts of the state, among the trustees there has always been a united effort to have University, technical colleges, and normal schools all under one board of trustees and one faculty. The state now acquiesces in this principle and the division contest no longer tempts politicians.

The regular annual income is derived from a one half mill tax, rent of educational lands, and appropriations from the federal government in aiding an agricultural college and experiment station. The income amounted to $185,000 for the scholastic year of 1911–1912. In addition to the farm, dairy, and stock buildings, there are seven general buildings. The following have been the presidents of the University: John W. Hoyt, LL.D., 1887–1890; Albinus Alonzo Johnson, D.D., 1891–1896; Frank Pierrepont Graves, LL.D., 1896–1898; Elmer Ellsworth Smiley, D.D., 1899–1903; Charles Willard Lewis, D.D., 1903–1904; Frederick Monroe Tisdale, Ph.D., 1904–1908; Charles Oliver Merica, LL.D., 1908–1912; Clyde Augustus Duniway, Ph.D., 1912–. The faculty is composed of forty women and men and the enrollment, 1911–1912, was 350. G. R. H.

XAVERIAN BROTHERS. — See TEACHING ORDERS OF THE CATHOLIC CHURCH.

XAVIER, ST. FRANCIS (1506–1552). — One of the founders with Loyola of the Society of Jesus. He was born at the Castle of Xavier in Navarre, and after a preparatory education at home entered the Collège de Saint Barbe in Paris, where he met Peter Faber and Loyola. Xavier was one of the seven who took the famous vow in 1534. After teaching in Paris for a time, Xavier went to Venice, where he joined in work among the sick and the poor. In 1540 he was appointed at the request of the King of Portugal to evangelize the East Indies. He left Lisbon for the East in 1542 and landed at Goa. His work included ministry among the sick, preaching and teaching the catechism to children. He gradually extended his field of operations until he had covered the whole of West India as far as Ceylon, Molucca, the Molucca Islands, and Japan. He is even credited on slender authority with visiting the Philippines. In 1552 he undertook to extend his field of work to China, but died at the island of Sancian on the Chinese coast. Xavier's work consists mainly in organizing the missions, spreading the gospels, and establishing schools and colleges under Jesuit control. He was canonized together with Loyola in 1622, but the bull was issued in the following year.

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XENOPHON. — An Athenian, son of Gryllus, of Erchīa, was born probably about 430 B.C., lived apparently till about 355 B.C. — soldier, historian, country gentleman, philosopher in a limited sense, a writer of special charm in narrating his own adventures and in discussing country life, originator of the historical romance. He was a pupil and intimate of Socrates when, in 401, his friend Proxenus, a Bœotian, invited him to join the Greek army which Cyrus was gathering, ostensibly for a local war. This young prince, brother of King Artaxerxes, was governor of the province of which Sardes was the capital. He had assisted the Spartans in the later years of the Peloponnesian war; for an Athenian to become his friend was dubious policy. Socrates therefore advised Xenophon to consult the Delphian oracle about the proposal. But Xenophon, having decided to go, so worded the question as to obtain from the oracle what he took as a sanction of his resolve. After the death of Cyrus and the treacherous murder of the Greek generals, Xenophon, who till then had accompanied the army merely as a friend of Proxenus and Cyrus, roused the Greek army from their despair, and was chosen general. By his energy, skill, and tact he at once became the virtual leader, and brought the force nearly entire from the heart of Persia through the hardships and perils of a wintry march among hostile mountain tribes to Trapezus on the Black Sea, and thence to Byzantium and ultimately to western Asia. Here in the spring of 399 it was incorporated with the Spartan army in a new war against Persia. It was probably after the battle of Coronea (394), in which he was on the Spartan side against Athens, that Xenophon was exiled from Athens as a disloyal son, and was indemnified by Sparta for his losses, receiving a considerable estate at Skillus in Elis, not far from Olympia. Here he lived as an active country gentleman, managing his property, enjoying the hunt and his horses and dogs, and writing. The battle of Leuktra shattered the Spartan alliance, and Xenophon lost his property at Skillus. Athens being now in alliance with Sparta against Thebes, he was restored to citizenship, but there is no evidence that he returned to his native city, from which he had been absent now thirty years.

The *Anabasis* is a lively and interesting account of his great adventure with the army of Cyrus. He speaks of himself always in the third person, but the internal evidence leaves no room for doubt as to the author. The lucid and easy narrative, very gradually introducing greater variety in thought and style as the difficulties of the army increase, renders it an admirable book for beginners. If boys do not find it interesting, the fault is with the teacher. Xenophon's minor deviations from the pure Attic idiom need cause no trouble; he writes excellent Greek, in some details accepting poetic or older usage, in others anticipating that of a slightly later time. The freshness and spirit of the *Anabasis* appear to mark it as his earliest work, written at Skillus not long after the events described. His admiration for the younger Cyrus was doubtless a factor in suggesting the historical romance, first of its kind that we know, with Cyrus the Great as its hero. *Cyropædeia*, or *Education of Cyrus*, is no adequate title, for the story carries Cyrus through an ideal career as conqueror and ruler to a peaceful death in old age, — openly disregarding history in many ways. Edification of the young seems to be its aim; one episode is a delicate little love story, reminding one of the late eighteenth century. In style it resembles the *Anabasis*, which it may have immediately followed, though we know nothing on that point. The *Hellenica*, or *Greek History*, is a continuation of the great work of Thucydides. The first two books bring the narrative to the close of the rule of the Thirty in 403 B.C., which appears to have been originally the end of the work. But the third book resumes the story, which is continued, sometimes in a rather annalistic manner, through the battle of Mantinea in 362 B.C. The reader notes a certain lack of vigor and insight, and thinks of the author's old age. The *Memorabilia*, or *Reminiscences*, opens with a few pages of serious discussion of the injustice of the jury in condemning Socrates. Then follows a rather loose series of reports of conversations which Socrates had held with various pupils and friends. They illustrate the moral influence of the writer's master in many directions. One episode is the earliest example in European literature of extended allegory. It is Xenophon's version of the famous moral apologue of Prodicus, *Herakles at the Choice of the Roads*. Compared with Plato's dialogues the narratives mostly lack depth and significance; the reporter is in this field rather commonplace, a good man of action but no profound thinker. The brief *Apology*, or *Defense of Socrates*, suffers still more by contrast with that of Plato; perhaps it is not genuine. The *Œconomicus*, or *Thrifty Husbandman*, is somewhat like a longer extract from the *Reminiscences*, but better done. About twenty pages of introduction are followed by nearly fifty pages, in which one Ischomachus is led to tell his experience on his estate, beginning as a young man with a girl wife, after Athenian fashion, whom he gently educates to be his loyal helper in the management and development of their common property, she attending to the household while he attends to all outside. The picture of life is charming, and Xenophon is evidently in love with his subject. With this go, in a way, the little essays *On Horsemanship* and *On Hunting*, topics on which modern lovers of dogs and horses find Xenophon a connoisseur, as he is on agriculture. The *Hipparchicus*, or *Skillful Cavalry Officer*, is slighter. *The Banquet* describes an evening with Socrates at a dinner. The *Hiero* is of still another type. It represents a conversation between that tyrant and the poet Simonides, and is intended to show how far from enviable is the life, so often envied, of an absolute ruler. The *Agesilaus* is a eulogy of that Spartan king; the little treatise on the Spartan constitution is of considerable value for its information; that on the Athenian constitution is older than Xenophon, of unknown authorship; that on *Athenian Revenues* is of doubtful origin, a curious mixture of shrewdness and lack of knowledge of economics. Apparently all that Xenophon wrote has come down to us.

Since in American schools the *Anabasis* is commonly the first ancient book read, a few words may be added on method. The task of learning the Greek forms is still far from completed; hence repetition of paradigms cannot yet be dropped, but it should be subordinated. The things to be emphasized are: daily reading aloud, with such care that translating can gradually receive less time; frequent dictation, until dictation can be taken accurately; then retroversion until that can be done accurately, with daily use of Greek in the formulas of the classroom, and a gradual increase in freer translation into Greek. In my own practice, about half the time in class is given to *reading on in the author*, as in an interesting story. The general principle is that ear, tongue, eye, and hand must be constantly in use, supporting one another, until a fair readiness in reading, writing, and speaking is attained — precisely as with any foreign tongue. T. D. G.

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The most convenient text-edition is that by E. C. Marchant, 4 vols., soon to be completed by a fifth containing the minor writings, in the series of Oxford Classical Texts, Oxford University Press. Vol. III contains the *Anabasis*. Of the numerous annotated editions the following may be mentioned.

Anabasis, by F. Vollbrecht, with German notes, Leipzig (Teubner), in frequent editions

Memorabilia, by Breitenbach-Mücke. (Berlin, 1889) Also by J. R. Smith, based on the preceding (Boston, 1903.)

Hellenica, by B. Büchsenschütz, with German notes

(Teubner), in successive editions. Also, based on this, Vol. I by J. I. Manatt, Vol. II by C. E. Bennett. (Boston, 1888.)

A good volume to accompany the *Anabasis* is *Durch Armenien*, by E. Hofmeister (Leipzig, 1911) — a military and geographical study of the retreat to the Black Sea.

There is also a good translation, not quite complete, by H. G. Dakyns, in 4 vols. (New York, 1890–1897.)

YALE, ELIHU (1469–1721). — Philanthropist born in or near Boston, Mass. He left America in 1652 and later took service in India, where in 1687–1692 he was governor of Fort St. George, Madras, and amassed great wealth. Through Jeremiah Dummer, Yale was influenced to give numerous benefactions to the Collegiate School at Saybrook, and on its removal to New Haven in 1718 the first building was named Yale College, a name adopted for the whole institution in 1745. Governor Yale died in England, and is buried at Wrexham in Wales.

See Yale University.

YALE UNIVERSITY, NEW HAVEN, CONN. — **History.** — The first distinct traces of a movement which resulted in the founding of a college in Connecticut appeared in the year 1701, when tradition describes the meeting of several Connecticut pastors in Branford, near New Haven, and the donation by these ministers of a collection of books for the founding of a college in the colony. Later the same year an act of the legislature of the colony granted liberty to erect a " Collegiate School," wherein youth might " be instructed in the Arts and Sciences " and " fitted for Publick employment both in Church and Civil State." In the fall of the same year organization under the charter took place, when seven trustees met in Saybrook, at the mouth of the Connecticut River, and voted to fix the school there, under Rev. Abraham Pierson as " Rector." The new college remained nominally in Saybrook for fifteen years, though in fact much of the work was done elsewhere. Rector Pierson remained at his home in Killingworth and taught the students there, and his successor, Rev. Samuel Andrew, stayed at his home in Milford and kept the seniors in that place. But the " Commencement " (*q.v.*) was observed each year in Saybrook until 1716.

An increasing library brought necessity for a permanent building, and the project of this building compelled action on the old question of the permanent site for the college, which in 1716, after a bitter controversy, was decided by a majority vote of the trustees in favor of New Haven and against the original site of Saybrook. At the commencement in 1718 the college, safely settled in New Haven in a commodious building at the southeast corner of the present old college quadrangle, was formally named Yale College in honor of Elihu Yale, a governor of Madras under the British East India Company, and son of one of the original settlers of the colony of New Haven, who had made an important donation to the institution.

The college continued in its one general building in New Haven until the rectorship of Rev. Thomas Clap, under whose administration was erected in 1750 a large brick dormitory, " Connecticut Hall," a building which, recently restored to its original form and appearance, stands now on the college campus. Through the influence of Rector Clap, a new charter was obtained from the colonial legislature in 1745, containing important modifications of the old one. By this charter the institution which had formerly been " a collegiate school " now became " Yale College, " and the former " Rector " became its President. The new charter also conferred ample powers of government on the " President and Fellows " who were to constitute the governing board or " Corporation," and these essential provisions remain unchanged to the present day.

Toward the third quarter of the century the work of the college was somewhat interrupted by the Revolutionary War, in which the record of Yale men was most honorable. The Yale soldier whose name is probably most highly cherished is Nathan Hale of the class of 1773, who volunteered as a spy in the service of General Washington and was captured and executed by the British in 1776. Following the Revolutionary War, Rev. Ezra Stiles, a man of great and varied learning, served as president of the college. Under his administration the corporation was made to include not only the successors of the original clerical trustees, but also, *ex officio*, the governor, lieutenant-governor, and six senior senators of Connecticut. This membership was later (in 1881) changed to include *ex officio* the governor and lieutenant-governor of the state and six members elected by the alumni at large from among their own number.

The college continued to grow in prestige and numbers during the first century of its existence, so that in 1800, under the administration of President Dwight (*q.v.*), the enrollment numbered 217, and at even that early date the number of students from the Southern and Southwestern states formed so large a proportion of the total enrollment as to begin to fix the character of the college as a national institution. President Dwight's far-sighted plans for Yale contemplated its expansion into a university with the four historic departments of philosophy, theology, law, and medicine. The germ of a divinity school had long existed in a group of graduate students, who were regularly taught by the Professor of Divinity, a chair that was filled by President Dwight. The formal organization of the theological department, under Rev. Nathaniel W. Taylor, came shortly after President Dwight's death. The establishment of the law

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Yale University.

department, which he had also contemplated, he did not live to see. The medical school, however, took form under his guidance. It was organized in 1812, and opened in the following year, in charge of four men, Dr. Nathan Smith, Dr. Eli Ives, Professor Benjamin Silliman, and Dr. Jonathan Knight. The contemplated department of law first appeared in connection with the college in 1824, when a private law school maintained for a number of years in New Haven was given up by Mr. Seth P. Staples, and was adopted by the college to the extent of having the names of its students put in the catalogue. In 1843 this school became the law department.

Development of the University. — During the administration of President Theodore D. Woolsey, from 1846 to 1871, Yale gained in reputation as an institution of scholarship and learning, and in strength and prosperity. With him were associated that notable group of educators, the imprint of whose personality has shaped the educational policy not only of Yale but of practically all American universities of the present day. The names that stand out particularly in this galaxy are: Professors Elias Loomis and Denison Olmsted of natural philosophy; Noah Porter of mental and moral philosophy; James D. Dana of geology; Thomas A. Thacher of Latin; Benjamin Silliman of chemistry, son of the "elder" Benjamin Silliman, also of chemistry, "the Nestor of American science"; James Hadley of Greek; William D. Whitney of language; Hubert A. Newton of mathematics; George J. Brush of metallurgy; Cyrus Northrop of rhetoric and English literature; Daniel C. Gilman of geography; Othniel C. Marsh of paleontology; John P. Norton, John Addison Porter, Samuel W. Johnson, and William H. Brewer of agriculture and agricultural chemistry, and J. Willard Gibbs in the beginnings of his notable work in physics.

An important development in the educational work of the college in this period was the organization of a new department of philosophy and arts. This new department came in answer to a new popular demand for technical instruction, especially in chemistry, which, as applied to the arts, was then in its infancy. There was a demand for a "new learning" different from that of the classical colleges, and one branch of this new department at Yale, the Sheffield Scientific School, was a pioneer in the effort to meet this demand. The other branch of this new department of arts and sciences at Yale was the graduate school, again a pioneer movement in American education. Of this new educational movement at Yale the president of the Carnegie Foundation for the Advancement of Teaching says: "Historically the account should begin with Yale College, when in 1846 graduate courses in philosophy and the arts were established. . . . The honor of having established the first creditable course of study for the degree of Doctor of Philosophy is due to Yale. . . ." Important expansions of the college work into fields other than those strictly educational are to be found in the establishment of the School of the Fine Arts, the Peabody Museum, and the Winchester Observatory. The last two were in their incipient stages at the close of President Woolsey's term. Later expansion of the work of the Department of Philosophy and Arts has included the establishment of the Music School in 1894, and the Forest School in 1900.

The institution, for many years a university in fact, became so in name in 1886 at the inauguration of President Dwight, grandson of the former president of the same name, when the corporate name was changed from Yale College to Yale University. President Dwight's term witnessed advance in work and unprecedented growth in numbers and equipment. The twelve years of the present administration, that of President Arthur T. Hadley, who succeeded President Dwight in 1899, have been marked by continual development, particularly in three important directions: (1) further perfecting of the organization of the various departments into one university; (2) increase in material prosperity; in buildings, endowment, and in numbers enrolled; (3) distinguished scholarly work of the faculty.

There had been in 1912 a total of 28,035 graduates of the university, of whom approximately some 17,250 were that year living. It is estimated that in addition students to a number equal to about half the total graduated were for a time enrolled in the university, but failed to receive a degree. In this roll of graduates, besides those mentioned in connection with the development of the institution and omitting the names of any now living, the following may be mentioned as of especial importance and influence: —

Signers of the Declaration of Independence: Philip Livingston, 1737; Lewis Morris, 1746; Lyman Hall, 1747; Oliver Wolcott, 1747. *Members of the Convention of 1787 who framed the Constitution of the United States:* William Livingston, 1741; William Samuel Johnson, 1744; Abraham Baldwin, 1772. *In theology:* Jonathan Edwards, 1720, probably the greatest theologian this country has produced; Lyman Beecher, 1797, a leader in the temperance and antislavery movement; Leonard Bacon, 1820, prominent in the antislavery contest; Horace Bushnell, 1827. *In law and public affairs:* James Kent, 1781, jurist, chief justice, and chancellor of New York; John C. Calhoun, 1804, Vice President of the United States, a chief exponent of the doctrine of state sovereignty; Alphonso Taft, 1833, Secretary of War and Attorney-General and United States Minister to Austria and Russia; William M. Evarts, 1837, Secretary of State; Morrison R. Waite, 1837, Chief Justice of the United States. *In invention:* Eli Whitney, 1792, inventor of the cotton gin;

Samuel F. B. Morse, 1810, inventor of the magneto-electric telegraph. *In letters:* Noah Webster, 1778; Donald G. Mitchell, 1841; Edmund Clarence Stedman, 1853. *In science:* Professors Benjamin Silliman, 1796, and Denison Omsted, 1817.

Yale has stood for two centuries, and stands to-day, for two distinct motives in education. The first is training of the student for public service, described in the words of the earliest charter as the fitting of youth for public employment both in church and civil state. In this training for large public service the national character of the student body has been a factor. At present approximately one fourth of the total number of Yale graduates are residents of the Western states; nearly one tenth are of the Southern states; over one third are of the Central states, and somewhat less than one third are of the New England states. The enrollment of students in the University shows a similar distribution of residence. This national character of the student body, no less than the fixed purpose of the University, has directed training at Yale toward broad public service. The second characteristic in education at Yale may be traced to the origin of the institution in a collection of books and the close connection between the development of the library and the institution. The value of research, emphasis on the necessity for a university to increase, as well as to rehearse, the present field of knowledge has been a characteristic principle of Yale's development. Present expansion in the direction of large, thoroughly equipped laboratories, and the scientific field explorations in the realm of natural history and geography are a later evidence of Yale's emphasis on the worth of enlarging the field of human knowledge.

The Present Scope and Organization of Yale University. — The permanent funds of the University, exclusive of buildings and grounds, were returned in the treasurer's report of 1911 as $13,388,765.88, besides $1,988,130.53 held by the Sheffield trustees for the use of one department of the University. The government of the University is in the hands of the President and Fellows, commonly known as the Yale Corporation. The corporation comprises in its membership the ten successors to the original trustees, the Governor and Lieutenant-Governor of Connecticut, *ex officio*, and six members elected by the alumni. Administration and policy within a department are determined by the faculty of the given department, subject to the approval of the President and Fellows.

The present organization of Yale University includes four main departments: Department of Philosophy and Arts; Department of Medicine; Department of Law; and Department of Theology. A brief outline of the organization and work of these Departments follows: —

I. Department of Philosophy and the Arts: Yale College: A four years' course of academic study, partially prescribed, leading to the degree of Bachelor of Arts (B.A.). The Sheffield Scientific School: A three years' course of study, partially prescribed, leading to the degree of Bachelor of Philosophy (Ph.B.) and a five years' course leading to higher engineering degrees. The Graduate School: Courses offered to college graduates leading to the following degrees: Doctor of Philosophy (Ph.D.) (see note below), and Master of Arts (M.A.) under direction of Faculty of Graduate School, Master of Science (M.S.), Civil Engineer (C.E.), Mechanical Engineer (M.E.), Mining Engineer (Mn.E.), and Metallurgical Engineer (Met.E.) under direction of Faculty of Sheffield Scientific School. The School of the Fine Arts: Regular and special courses in drawing, anatomy, perspective, painting, modeling, architecture, and illustration. Degree of Bachelor of Fine Arts (B.F.A.) conferred for advanced work of distinction. The Music School: Courses in theory of music leading, after four years' work, to degree of Bachelor of Music (B.Mus.). Also courses in piano, organ, violoncello, singing, and chamber music. The Forest School: A two years' course, open to college graduates, leading to the degree of Master of Forestry (M.F.). (Note: Properly qualified women are admitted as candidates for the degree of Doctor of Philosophy, also as members of the Schools of Music and Fine Arts.)

II. Department of Theology: A three years' course, open to college graduates, leading to the degree of Bachelor of Divinity (B.D.). There are five courses of study, emphasizing respectively Theology, Missions, Religious Education, Philanthropy, and Philosophy.

III. Department of Medicine: A four years' course, following a preparation of at least two years' college study, leading to the degree of Doctor of Medicine (M.D.).

IV. Department of Law: A three years' course, open to college graduates, leading to the degree of Bachelor of Laws (LL.B) or Bachelor of Civil Law (B.C.L.). Higher law degrees conferred for graduate work.

The university campuses include a total of some seventy acres, extending north and south in a narrow strip for approximately a mile from the old campus and the medical school buildings on the south on either side of Chapel Street, the principal thoroughfare of the city of New Haven, to the Pierson-Sage Square and the forest school and observatory property on the north on Prospect Hill. Important university collections are those of the library, including some 900,000 volumes, the collection in natural history of the Peabody Museum, the Trumbull paintings of the American Revolution and the Jarves Italian Masters of the School of the Fine Arts. The university gymnasium, the athletic fields and boathouse, the infirmary, the dining hall (with accommodations for 1000 students), the church of the university, the endowed university lectures, the university concerts, etc., are open to members of all departments of the university. The faculty in 1911–1912 numbered 524 members; the student enrollment in the same year was 3229. E. R. E.

See College, American; College Graduates, Professional Distribution of; University Graduates, Professional Distribution of.

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YANKTON COLLEGE, YANKTON, S.D. — A coeducational institution founded in 1881 under the auspices of the Congregational Church, beginning actual work of instruction Oct. 4, 1882. The material equipment consists of a campus of twenty-five acres, upon which are located seven buildings; also an athletic park of five acres. The total value of the equipment is about $200,000. The endowment amounts to nearly $350,000, of which about $150,000 is at present nonproductive. The faculty numbers twenty-three persons. The total attendance in all departments for the college year is about 350, of whom 100 belong to the college proper. In addition to the regular college work, the following subsidiary departments are maintained: an academy; summer school; normal, music, art, and elocution schools. The completion of a full four years' high school course is a prerequisite for admission, and the completion of 120 semester hours of work is necessary for graduation. The B. A. degree is given. W. J. McM.

YARD DUTY. — The supervision of the pupils' activities on the school grounds during the periods of recreation is termed yard duty. Such oversight extends over the time allotted for play and recreation before school, at noon, and during the morning and afternoon recesses. As there are usually two playgrounds or school yards, one for boys and another for girls, teachers are assigned by turn to each, sometimes for a specific day in the week, sometimes for a whole week or other longer period. The number of teachers assigned to yard duty has distinctly decreased as the ideas of free play and self-government have gained recognition among teachers. Supervision of the children's play activities is constantly becoming less rigid, the presence of the teacher being maintained largely for emergencies. H. S.

See School Management; Playgrounds.

YONGE, CHARLOTTE. — See Women, Education of.

YORK COLLEGE, YORK, NEB. — A coeducational institution founded in 1890. The following departments are maintained: college, academy, normal, music, oratory, commerce. The entrance requirements are based on the work of a standard high school. The college grants the degree of B. A. The enrollment of collegiate students in 1911–1912 was ninety six. The faculty consists of twenty-one members.

YORK SCHOOL. — The grammar school of the Cathdral Church of St. Peter of York, commonly called St. Peter's School, is one of the most ancient schools of England, third or fourth oldest in foundation, and with a longer and more continuous history than perhaps any other school. We may infer from a reference of Bede to the song schoolmaster (*magister ecclesiasticæ cantionis*) about 633 that there was a grammar school as well. At all events about the year 705 we have a tale preserved in Bede told him by Heribald, afterwards abbot of Tynemouth, how as a boy he had been one of the bishop's clerks and sent to the grammar school and the song school, and how they rode out together with the bishop and lay boys among them. However, the fame of York School is due, not to Bede, but to Alcuin's (*q.v.*) poem *On the Bishops and Saints of the Church of York*, written when Alcuin was its master. After saying that Archbishop Egbert (*q.v.*) was an admirable teacher as well as bishop, he enlarges on the deeds of his own master, the wise Albert (*q.v.*) or Ethelbert, who succeeded him. Educated under Egbert in York School, he was, when quite young (*i.e.* about 750), made advocate of the clergy and at the same time schoolmaster in the city. The curriculum of the school was encyclopædic, and covered the whole ground from the grammar school to the theological faculty of the later universities. A catalogue of the chief books in the school or church library is given and shows that the curriculum was no empty boast, but that it was founded on real authors. As was natural when Latin was in effect still a living tongue, the classical authors are overshadowed by the Christian Latins. Still they include Aristotle, Cicero, Vergil, Statius, Lucian; preceded by the schoolmaster poets: Juvencus, who turned the gospels into Latin verse, *c.* 330; Sedulius, with his Easter Song, *c.* 460; Prosper of Aquitania, *c.* 420; Arator, *c.* 550, who versified the Acts of the Apostles; and Venantius Fortunatus, the friend of Gregory of Tours. Grammarians were in full force, especially Priscian and Donatus (*qq.v.*). When Albert retired he separated the archbishopric from the schoolmastership, giving the school to Alcuin himself about the year 776. In 796 he advised Archbishop Eanbald II, a former pupil, to separate the grammar, song, and writing schools, and put each under a separate master in order to avoid idleness and waste of time. The York library seems to have been valuable, for Alcuin in one of his last letters written from the abbey of Tours asks for some books to be sent to him, "that he might spread the sweet savour of England on the banks of the Loire," and between 849 and 854 the abbot of Ferriéres wrote to borrow books of Jerome and Bede, and Quintilian's *Institutes of Oratory*, to be copied. This is curious, as the discovery of a whole Quintilian by Poggio at St. Gall in

1416 was one of the great events of the Italian Renaissance (*q.v.*) and had a potent influence on school development.

In the dark days of the Danish and Norwegian invasions, the school disappears from history, but there is no reason to suppose that it disappeared in fact. The History of Hugh the Chanter or Precentor of York, written before 1128, tells us that the first Norman Archbishop found the church deserted by all the canons but three (out of seven) and half in ruins, owing to the Conqueror's "harrying of the North." He at first organized them on the quasi-monastic model of the Rule of Chrodegang of Metz under a provost, with a common dormitory and refectory, instead of separate houses, and a schoolmaster (*magister scolarum*) was reëstablished also. The schoolmaster is referred to in several documents of this century. Already when the statutes of the cathedral were first written down and codified in 1307 it was found that the chancellor was bound to appoint as master a "regent in arts," *i.e.* an M. A. of one of the universities, actually engaged in teaching, and according to the "ancient custom" he was to hold only for three years, and not more, except by special favor for four years. When the cathedral was rebuilt in 1287, on a more extensive scale than before and as it now stands, the schoolhouse was swallowed up in the new building, and the dean and chapter by an ordinance gave the prebendary of Donington's house for a schoolhouse in its place. The chapter looked sharply after the chancellor to see that he duly maintained the grammar school, as in 1344 in the case of the non-resident and pluralist chancellor, Master William of Abberwick, a former fellow of Merton College, and Dean of Auckland, who neglected to appoint a master. During the vacancy of the chancellorship in 1349, owing to the black death, the chapter appointed a deputy schoolmaster to fill the office. In 1368 the effects of the black death (*q.v.*) were such that there was great difficulty in finding an M. A. to fill the office of schoolmaster on the old terms of a three or five years' tenure. The chapter, therefore, confirmed the chancellor's action in appointing Master John of York M. A. to hold for life. That there was no lack of boys in the school at this time appears from the will in 1369 of Richard Bekyngham, an advocate of the Court of York, no doubt an "Old Boy," giving 2*d.* apiece to sixty poor clerks of the grammar school, of good conduct, to be named on a roll of the schoolmaster, to sing the Psalter after his funeral for his soul. As sixty were to be selected for poverty and good behavior, the whole school must have been considerably larger in number. In 1375, however, the chancellor had to invoke the thunders of the church against a certain Nicholas of Ferriby, who without license was keeping a grammar school in York to the prejudice of Master John of York and the pernicious example and scandal of many. Ferriby was inhibited from keeping school on pain of excommunication. (See TEACHERS, LICENSING OF.) From 1420 to 1472 there were in succession three grammar schoolmasters, and all three of them were, contrary to the usual notion as to such things, married men. In 1486 a non-resident chancellor, Thomas Chandler, ex-Warden of Winchester College, Chancellor of Oxford University, and Dean of Hereford, appointed a master for life, who held office for twenty years. The *Valor Ecclesiasticus* of 1535 reveals to us that, as in the days of Alcuin, so in the days of Henry VIII, the school was largely a boarding school, the Abbey of St. Mary's, about 200 yards from the minster, maintaining "a mansion called Conclave alias the Clee, by the outer gate of the monastery," in which "fifty poor scholars who attended the grammar school of the metropolitan church of York" were boarded and maintained under a governer or bailiff at the monks' expense, the abbot being liable for six, the prior for two, and each of the twenty-two senior monks for one, while the other twenty, presumably of a poorer sort, were kept on the broken meats of the convent. This is said to be according to ancient foundation of the monastery by the progenitors of Henry VIII, the monastery being attributed to William Rufus. York, being a secular cathedral, remained unaffected by the dissolution of monasteries, except apparently for the loss of the *conclave* or chamber. It was no doubt to supply its place that on March 14, 1557, the chapter obtained from Cardinal Pole the annexation to "the chapter table" of a hospital known from the place in which it stood as the Horsefair Hospital, founded about 1318 for "chaplains old and sick and no longer able to perform divine service." There were then no chaplains in the hospital and the master pocketed the whole income. Following the example of St. John's Hospital, Cambridge, it was now suppressed and conveyed to the chapter in trust for the school. By deed of April 30, 1557, the chapter accordingly purposed, in order that "with the sword of the spirit, that is the word of God, in the church militant, shepherds may be able to put to flight the rapacious wolves, that is devilish men ill understanding the Catholic faith," to found a grammar school of fifty boys in the hospital. The three patrons of the hospital were to be allowed to appoint a certain number of the boys "to be frelie taught thayre grammar and to have their meat, drink and all sufficient education frelie." The school was evidently intended to be on the model of the cathedral grammar schools of Henry VIII's foundation, like Westminster (*q.v.*). It is to be feared the wolves were not driven away, as the first absolute evidence of the school being moved to the hospital is in 1575, when the then

Protestant chapter appointed a master "on the lawful removal," for a cause not stated, of the former master "of the Free School in the Horsefair near the city of York," the hospital being then outside the city walls, though now in a crowded part of the city. How long, if ever, boarders were maintained does not appear. The whole endowment was only worth £33 13*s.* 4*d.* a year. The patrons' right was bought up in 1585 to 1589. The hospital was claimed in 1621 as having properly been confiscated to the Crown under the Chantries Act and the chapter then obtained a new charter. From that time at all events the school was not a boarding school. When deans and chapters were abolished during the Commonwealth, a special ordinance was made by Parliament, confirmed by the Protector Cromwell, for the preservation of "the Minster of York and the school called Peter's School."

Little seems to be known or knowable about the school after this. The appointments of masters were regularly made by the chapter after the Restoration. In 1736 the school was held in the disused St. Andrew's Church, at the south of the minster, the hospital being found too small. A century later, in 1833, it was removed to new buildings on the site of the Old Deanery on the south side of the minster yard. In 1844 it again removed to what was then a rural site in Clifton, more than half a mile to the west of the minster, to the buildings of a proprietary school for yeomen and others, which had failed, with about four acres of ground. This enabled it again to become a boarding school and as such it met with fair success, many people of good standing in Yorkshire, particularly the clergy who could not afford the "Great Public School" fees, sending their sons. In 1853 it numbered 138; in 1866, 190, of whom 105 were boarders; in 1881, 163, of whom 69 were boarders. On July 18, 1898, a scheme was made under the Endowed Schools Acts which released the school from the exclusive government of the dean and chapter, and placed it under a body of twelve governors, in which they are represented by the dean and four representatives, while the Archbishop has two, and the councils of the city and of the three ridings of York and of the Yorkshire College at Leeds one each. The endowment was then found to have risen in value to about £1500, and would have been much larger if the chapter had not made in the last century an exchange of lands between the school and the chapter, in which the former got some outlying agricultural land and gave up some lands by the old Horsefair site, which in a few years became highly valuable building land. The school was still weighted with a large part of the debt incurred in the purchase of new buildings sixty years before, no sinking fund having been established. Considerable improvements in and additions to the buildings and site have been effected since the scheme. The competition is severe. There is Archbishop Holgate's school in York, one of three free schools which competes for day-boys in Yorkshire, founded by that archbishop as one of the first-fruits of the Reformation. There are many revived grammar schools on a large scale in the country, which like Sedbergh and Giggleswick have far larger playing fields, with country air and beauty of scenery to compete for boarders. Nevertheless, this ancient school holds its own. Under the Rev. Canon E. C. Owen, appointed in 1900, and six assistant masters, there are 146 boys in the school, 54 of whom are boarders in two houses. The tuition fees are 12 to 18 guineas a year, and the boarding fees 36 to 50 guineas. It still contributes a considerable quota of pupils to the universities, and, as in the days of Albert and Alcuin, is still recognized as one of the great schools of England.

A. F. L.

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Our Oldest Public School. *Fortnightly Review*, November, 1892.

YOUMANS, EDWARD LIVINGSTON (1821–1887). — Scientist, born at Coeymans, N.Y., and educated in the common schools of Saratoga Co., whither his parents had moved. At the age of seventeen he became almost blind through ophthalmia, moved to New York to be cared for, and settled there. In spite of his malady he devoted himself with the help of his sister to scientific studies. He studied chemistry and physics, and later medicine, and became an M. D. of the University of Vermont. In 1852 he began to lecture on scientific subjects, aiming to popularize the most recent theories in the field. With the same end in view he arranged for the sale and republication of scientific books by foreign authors, especially those of Herbert Spencer. In 1871 he planned the *International Scientific Series*, and in 1872 began the publication of the *Popular Science Monthly*. Youmans was the author of several books, including: *The Chemical Atlas* (1854), an extension of an earlier work in which the laws of chemical science are given in colored diagrams; *Handbook of Household Science* (1857); *The Correlation and Conservation of Forces* (1864); and *The Culture demanded by Modern Life* (1868), a compilation of essays by different authors on the claim of sciences to a place in a liberal education. The last book included an introduction and an essay on the *Scientific Study of Human Nature*.

YOUNG MEN'S CHRISTIAN ASSOCIATION, EDUCATIONAL WORK OF. — **History.** — Founded in 1844 in England, the Y. M. C. A. was begun with the sole idea of benefiting men spiritually. But in December, 1845, the London Association reported the beginning of the Exeter Hall educational lectures, which became famous and continued twenty-one years; also the formation of mutual improvement or literary societies. In 1849 reading rooms and library work began. Class work was not organized until after the Association movement started in America in 1851 at Montreal and Boston.

From 1851, for a period of fifteen years there was very little educational work in any Association in North America. A few Associations, like Boston, Montreal, New York, and others, conducted reading rooms, some library work, a few lectures, and occasionally a literary society. Apparently only a small portion of the interest in helping men educationally was evident in the Association until thirty-five years or more after its planting on North American soil, or until after the first generation of its founders and promoters had passed away. There have been inferences that during these early years the zeal of the American leaders for the religious work, together with the fear that the so-called secular features might choke or destroy the religious, was so pronounced that they not only did not encourage educational work, but seemed to seek every opportunity to oppose and discourage it under Association auspices.

From 1866 to 1880 the work was regarded as a side issue of the Association, and left to take care of itself. While it was generally opposed and discouraged, yet more of the work was tolerated, and some class work was organized in addition to the other features, but these classes were almost wholly confined to the dead languages, and largely limited to divinity students.

From 1880 to 1893 some effort was made to encourage the work. A new conception began to develop which realized that the Association stood for the development of the entire man, — spiritually, educationally, physically, and socially. The educational features in the Association, still opposed by many, began to be promoted by a few. Practical talks were introduced, educational clubs were expanded in variety and novelty, class work was developed in commercial and language subjects, and a beginning was seen in industrial and science subjects.

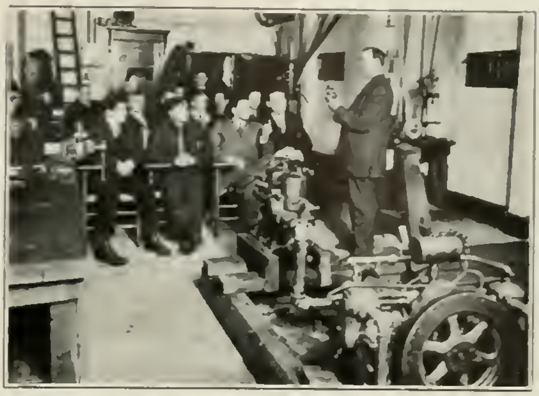
From 1893 to 1900 the work began to be encouraged and promoted in many local Associations. The International Committee, through a new department of its service, began the general encouragement of this work. Principles were studied, experience of other educational organizations was secured, a few local Associations employed special secretaries to promote educational work, special effort was started among boys, and the work as a whole came to be regarded as a vital part of the Association movement. Increased interest was found in many forms of applied science as related to manufacture and to industry. A system of international examinations, with twenty national authorities as examiners, was inaugurated, which improved the character of the work done and increased the respect and support of the public.

From 1900 to date is the period of expansion and extension. Spring terms are added to the winter work, day work becomes more prominent as an expansion of the evening work, summer schools for boys are organized, special courses as automobile, accountancy, art and decoration, salesmanship, advertising, real estate, insurance, fruit culture and many others as they are found to meet the present-day needs of men are started. Work outside of the building begins to grow rapidly. Much interest is taken in new forms of industrial and vocational training, in agriculture, in gardening, in live stock, in poultry raising, and scores of the newer vocations.

Purpose and Principles. — The Association has for its object the development of all-round Christian manhood and boyhood; to help men and boys help themselves; to inspire them to higher ideals of life and service; to acquaint them with and help them wisely to develop their own capabilities; to increase habits of industry and thrift; and to prepare them to render more easily, willingly, and effectively the highest type of industrial, social, and Christian service. It encourages, and strengthens all other good forms of educational effort; improves citizenship, commerce, and trade through appropriate facilities offered at any hour of the day or night; and places emphasis upon Christian character-building as fundamental. It is the Church at work among men and boys for the making of men, not money; for developing successful lives, not for the mere making of a living; for cultivating and promoting altruism, not selfish commercialism. The Association is not bound down by tradition, has no so-called system to hinder its flexible efforts, and is thus less unwieldy than some other educational organizations. In its efforts to serve men and boys it is limited only by the means at its disposal. Twenty years' experience indicates that the best results in the conduct of Association educational work in any community are based on the following principles: —

(*a*) Its policy is first to study local conditions carefully, to discover the educational needs of men and boys, then to mature such plans with available means as will best meet such needs. (*b*) It will have ample encouragement or supervision and generous support. Money and efficient men thus invested yield largest returns. (*c*) It will be adapted to local conditions in various features, in leaders, in times and places of conduct. One secret of its success is to fit the system to the person rather than, as is the case so often in public schools, to fit the person to the system. (*d*) It

Class in Telegraphy, St. Louis, Mo.



Mechanical Engineering, Seattle, Wash.

Teaching English to Foreigners, New Britain, Conn.

Electrical Engineering, Boston, Mass.

Business Administration, New York City.

Class in Plumbing, Patterson, N. J.

EDUCATIONAL WORK OF THE Y. M. C. A.

will be adequately administered. A board of directors, committee force, and employed officers with conviction, appreciation, and leadership are necessary. (*c*) It will be largely elective and flexible to meet the varying needs of different bodies of men and boys, and conducted at such times and places, day or night, as are most expedient. (*f*) It will seek to be more and more closely related to the present needs of commerce and industry, at the same time placing emphasis on such cultural training as will enrich and develop the lives of men and boys. The school, the shop, the office, and the vocation will come more and more closely together, and this will cause new and varied forms of effort and working relations between the Association and the factory, the business and the vocation, for promoting appropriate educational privileges. (*g*) It will include the best available talent for teachers and leaders, many of whom will receive substantial salaries because of the special expert nature of their service. The dominant spirit in such teaching, however, will be altruistic rather than commercial. (*h*) It will encourage and strengthen rather than compete with all good educational efforts. With its methods, purposes, social atmosphere, and variety of features, the Association will be attractive to bodies of men not touched by other agencies, and thus will create a unique field of its own for needed service. (*i*) It will charge small tuition fees to cover a portion of the cost of its principal features, knowing that a person appreciates and makes larger use of that in which he invests something of his own. (*j*) It will teach the dignity of labor, encourage thrift and savings, cultivate appreciation for the intellectual and the more abundant life, help men put more into the world because the Association helps them to get more out of it.

Need for Supplementary Vocational Training. — We are grateful for, and proud of, the American public school system with all of its many and increasing educational opportunities and privileges, but when we discover the large numbers of men and boys who are not yet taking advantage of such privileges, something of the real need becomes apparent. We learn from various reliable authorities, national, state, and local, that over sixty per cent of the boys have left school before the end of the grammar grade; that the average length of a boy's schooling is less than six years and is taken before he is fourteen; that only a small per cent of the males in the nation are fitted by definite educational training for their occupations; that opportunities for practical vocational training in America are very limited in comparison with those of some other nations; that illiteracy, even among voters in America, is much greater than in several other countries.

These and other striking facts show the need for a fuller use of the vast wealth of American public school facilities, and especially for adapted supplementary training in vocational lines for men and boys who have left school. Indeed experience and observation show that the need for such additional facilities is many times greater than all kinds of constructive effort yet provided in this direction.

Opportunity. — In view of these educational needs of men and boys, and to help meet the vocational demands of our present-day complex civilization, there is an unparalleled opportunity for the service of individual men, of clubs, of Young Men's Christian Associations, of the Church, and of any other organization to help provide for this situation by increasing the needed facilities for vocational and other forms of educational training among men and boys.

As the Church through the past 200 years, when facing educational needs, has so often helpfully coöperated with the public schools and led in providing additional training through organizing and fostering colleges, technical schools, and other appropriate features, so to-day its leaders through the Young Men's Christian Association are striving to meet some of these needs. For twenty years these Associations have been steadily developing practical educational features, increasing the number of subjects taught from 20 to 120; the number of teachers from 500 to over 2600; the practical talks and lectures from 400 to over 9400; the number of students from 12,600 to nearly 68,000 employed men and boys; the annual expenses from $60,000 to over $900,000; and the annual tuition receipts from nothing to about $630,000.

Scope and Nature of Work. — Many years of Association experience in an ever-enlarging program of educational privileges conducted at all times, both inside and outside of Association buildings, to meet needs of men and boys, shows for 1912 the following general divisions of such privileges with their record in the same.

Reading Rooms. — The Association provides for and encourages the careful reading of the most appropriately helpful periodicals and magazines, and such technical or trade journals as may be most appreciated locally. About 1,000,000 men and boys daily use these features in 1600 different Associations.

Books and Libraries. — Stimulating the reading of good books is increasingly practiced. The working library for study and research is the center of educational service. Where feasible, the use of all public, private, and traveling libraries is encouraged. Seven hundred thousand good books were thus drawn out and read in the past year.

Educational Lectures. — Formal, high-grade lectures for mixed audiences with paid speakers of national reputation are promoted. Two thousand sixty-seven such lectures were given.

Practical Talks. — Informal, inexpensive talks given by local talent to small groups of men or boys at any time or place are promoted. There were 7365 such talks attended by 416,000 employed men and boys.

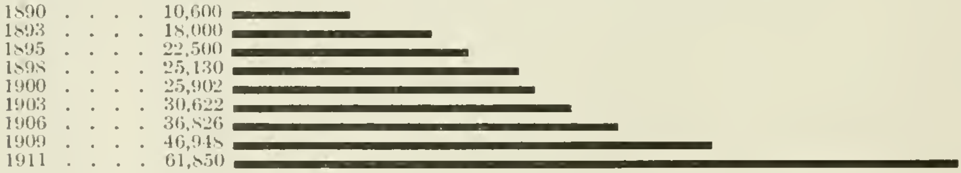
Educational Tours. — Weekly or monthly trips to places of historical, social, industrial, scientific, or religious interest are enjoyed under competent leaders.

Educational Clubs. — Many different kinds are promoted for research, study, discussion, reading, and social service; 22,667 members were in 1061 such groups.

Class Lecture Series. — Professional, semi-professional, and vocational subjects with experienced teachers and leaders, for mature men, conducted on the university extension basis with lectures, quizzes, and study, are steadily increasing in number and efficiency. Over 5000 men, the majority being college men, pursue twenty kinds of such courses.

Educational Classes. — These include commercial, industrial, academic, language, and other grammar and high school subjects taught by experienced men teachers. Each of the 120 subjects or courses is conducted from twenty-five to eighty sessions during the season. This class work, part of the educational department with its 2607 paid teachers and 67,321 students, requires more thought, time, and money than all the other distinct educational features of the Association combined and is of increasing importance in supplementing public and private schools.

Number of Different Students in Association Educational Classes



Tutoring. — In addition to the work in the classroom many Associations employ one or more tutors for single students. About 7000 such students are thus being aided.

Extension Features. — Over 130 Associations offer appropriate educational privileges for men and boys outside the Association building as in shops, offices, stores, homes, clubs, rented halls, public school buildings, and other places. Over 100,000 men and boys have been thus aided.

Coming Americans. — Many Associations are teaching non-English-speaking males in our commercial and industrial life, to speak, to read, and to write in English. By helpful counsel and proper instruction they are also led into more intelligent American citizenship. Over 10,000 such foreigners thus have been taught English.

Vocational Training. — Apprentice schools, continuation schools, industrial education, vocational guidance, etc., are demanding large and increasing attention. The great variety of opportunity for civic training, thrift, and savings, social service, visual instruction, exhibits, and contests, etc., are being utilized to help men and boys as far as ability and the means at hand permit.

Day Work. — A number of Associations in addition to their evening work conduct regularly organized work in the daytime, including various kinds of schools, courses, and subjects for males of all ages over fourteen. In no sense is this done to compete with the public or private schools, but at the repeated requests of parents to supplement the work of existing schools. Over 5400 males are thus enrolled in the regular Association day schools.

Different Groups Reached. — While the great majority of the work thus described is conducted in city Associations, yet there is a growing work, with adapted privileges, among each of the following groups: (*a*) Railroad Associations have over 2800 men in definite class work, in addition to the other facilities of reading rooms, library work, practical talks, educational clubs, etc., to correspond. (*b*) Army and Navy Associations have 759 enlisted men in class work, supplemented by a variety of other educational features. (*c*) Industrial Associations in manufacturing plants, cotton mills, lumber camps, mining companies, etc., have over 3500 men in class work in addition to the other features. (*d*) County Work or Rural Associations have 1416 country boys and men in class work in addition to the many hundreds of practical talks, lectures, literary societies, agricultural institutes, and the like. (*e*) Colored Men's Associations have 506 students in class work aside from their numerous other educational privileges. (*f*) The Student Associations in colleges and universities have about 1500 students taught by tutors, in addition to their various educational clubs, lectures, and discussion groups under Association auspices. (*g*) A small but growing work is being organized among the Indian Associations.

(*h*) Among Boys. A large and important work with over 10,000 boys already enrolled in definite class work is in operation. The employed boys, who have so largely left public schools and among whom there is such great need for vocational training, form the largest single opportunity of the Association movement. About 2000 boys, twelve to eighteen years of age, are studying in Association Camp Schools conducted from two to four weeks each during the summer. There are over 2000 other boys in the vacation schools conducted in the city Association buildings for eight weeks during July and August. This of itself is one of the strongest supplementary and helpful features to the public school movement. Indeed, many boards of education seeing the needs of boys and realizing that some of these could be met in the summer time, when the public schools are usually closed, and seeing the successful efforts of the Association summer schools, have been led to organize summer terms in the public school buildings. (See annual *Reports.*)

CLASSIFIED EDUCATIONAL STATISTICS

YEAR 1911–1912

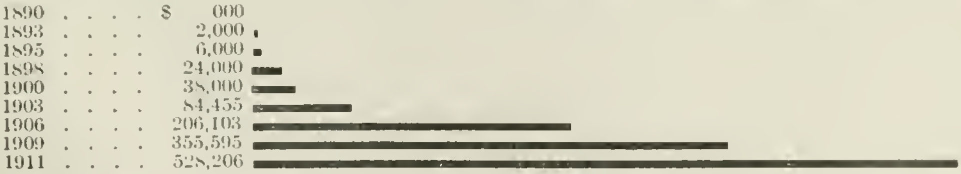
	Kinds of Associations							
	City	Railroad	County and Town	Colored	Army and Navy	Canal Zone	[1] Among Boys	Totals
Reading Rooms Periodicals	27,154	9,430	290	789	957	597	5,108	39,211
Libraries Books drawn and used	320,794	229,062	1,904	915	53,811	29,456	73,843	636,002
Lectures and talks	5,709	1,997	1,277	276	127	46	1,535	9,432
Educational Club members	17,522	1,509	2,459	464	102	611	6,490	22,667
Students in Class Work	61,826	2,738	1,416	506	759	76	11,185	67,321
Paid teachers	2,486	76	——	13	25	7	296	2,607
Total expenses all educational features	$865,375	$31,341	——	$1,622	$6,170	$2,538	$46,207	$907,047
Receipts from tuition fees	$620,189	$7,014	——	$518	$1,603	$180	$37,100	$629,534
International certificates	2,109	37	3	——	——	——	576	2,149
Students in class work outside building	10,250	164	——	6	——	36	619	10,420
Students in regular day work	5,179	270	——	15	——	——	1,453	5,461
Students in boys' summer schools	2,201	——	——	——	——	——	2,201	2,201

[1] These figures under Boys' Departments are included in the totals under City, Railroad, etc.

Reprint from *Educational Notes*, September, 1911. (Formerly *Information and Suggestions.*)

Value to Men. — The value of Association educational work to men is realized in that (*a*) it enables them to use wisely leisure time day or night. A man's success or failure depends upon the use of his leisure hours. (*b*) It inspires them for larger usefulness. Every form of proper study becomes helpful not only in business pursuits, but leads to a larger and higher life and to a broader mental horizon. (*c*) It helps men and boys to discover their bent, and through proper training of such inclinations, desires, and abilities they are led into more congenial and successful life work. (*d*) It develops larger and more adaptable capacity for service. (*e*) It fits for promotion and for increase in salary. Since 1893 over 400,000 different men, in from 10 to 200 class sessions each, have been aided in Association class work alone. Economists place the increased value of the service, due to the training a person secures who takes a thorough course of class work, for one season, at from $75 to $150 per year. (*f*) It helps boys to remain longer in public school and thus realize far more from the excellent public school facilities. (*g*) It develops Christian character — the climax of best educational effort. As a bad man educated is often one of the most dangerous men in the world, so by interesting contrast we find from history that in the training of the great majority of the world's best leaders and workers, Christian character development has been one of the chief factors.

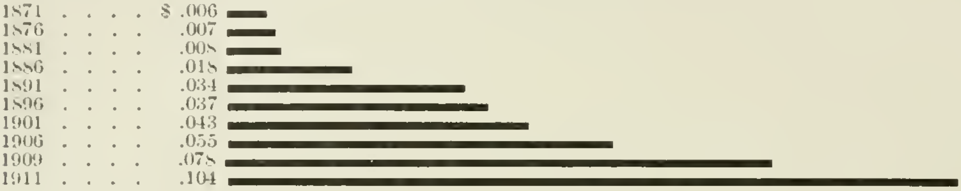
RECEIPTS FROM STUDENTS' TUITION FEES — IN ADDITION TO MEMBERSHIP FEES — YOUNG MEN'S CHRISTIAN ASSOCIATIONS



Administration. — The International Committee is the servant and agent, not the executive, of the more than 2000 various Young Men's Christian Associations of North America. Its relation to these various Associations is, therefore, only advisory and suggestive, not dictatorial. Each local Association handles its own business, employs its own officers, raises its own budget, determines its own local policies and, therefore, conducts such forms of educational activity as it deems feasible and best. Only, therefore, in proportion as each local Association can be led into a more intelligent and appreciative attitude concerning the educational needs of men and boys in its community, and encouraged by earnest conviction to meet such needs to the extent of putting much time, money, effort, and equipment into such work, are corresponding results realized.

Each local Association has a board of directors, selected from the best Christian business and professional men of the community. This board forms several subcommittees, one each for the promotion of the various principal phases of Association effort. They employ such paid officers as the means at their disposal permit and the demands of the community indicate. Of the 2000 local Associations only about 400 have an educational subcommittee, and less than 100 of these as yet employ special secretaries to promote appropriate educational activities.

Annual Cost of Association Work — All Departments, as Religious, Physical, Educational, and Social — per Capita of Population



The 130 educational secretaries and assistants employed for such promotive work in eighty-four Associations, are from twenty-five to fifty years of age, of college and university training, with salaries from $1200 to $3000, and have an average tenure of office of about five years.

Summary of Accomplishments. — When the International Committee began to encourage and promote this work in 1893, it was crude and superficial and the interest was indifferent. There were only a few courses of study and these mostly in commercial and language subjects and very poorly attended; only a handful of poorly paid teachers; little or no public respect, and no encouragement from educators; but few students, and those largely in the three R's; it was regarded as a side issue and not as a part of the regular Association work; had no special provision in buildings or equipment; and no tuition receipts. Now there are over 120 courses for men and boys, industrial, trade, and vocational, as well as commercial and language, and with more regular attendance than in public evening schools; increasingly favorable public respect and coöperation from educators; nearly six times as many regular students, including business men and college graduates, in addition to those in the three R's; it is regarded as a vital part of Association work instead of as a side issue; with large and specially designed buildings or sections of the same to provide room and equipment for educational work; and with receipts from tuition fees alone to provide 65 per cent of the expenses of a work fifteen times as large as nineteen years ago.

DEVELOPMENT OF EDUCATIONAL CLASS WORK, 1893–1911

	1893	1911	1912
Special educational supervision	1	69	84
Associations reporting class work	300	464	473
Different students	12,000	61,850	67,321
Recitation hours per average subject	25	54	54
Per cent of attendance . . .	70	84	84
Class tuition fees	$ 2,000	$528,206	$629,534
Expense of class instruction .	$25,000	$482,144	$412,852
Income from educational endowment	$ 2,500	$ 11,003	$ 12,281
Expense of supervision . . .	$ 2,000	$171,549	$185,639
Associations in International Examinations	——	137	139
Number certificates won . .	——	2,291	2,119
Total expense, educational work, all features, including advertising, supervision, est.	$72,000	$727,889	$907,047
Total receipts from endowment, students — fees and memberships — clubs, talks, etc.	$78,000	$739,827	$872,376

In Foreign Lands. — The relation of the International Committee to the various Association interests in many foreign nations as China, Japan, India, South America, Africa, Turkey, etc., is such that more and more these nations are seeking and using men, methods, and policies from the experience of the North American Associations. While the educational work in such foreign Associations is comparatively small, yet with appropriate leadership and support it will become one of the strongest elements in the development of efficient Christian manhood and boyhood in such nations. There are already more than a thousand teachers giving instruction to over 15,000 students in these Associations. G. B. H.

YOUNG WOMEN'S CHRISTIAN ASSOCIATIONS OF THE UNITED STATES OF AMERICA, EDUCATIONAL WORK OF. —

The National Organization. — The national organization of the Young Women's Christian Associations (1912) is composed of 253,406 members in 875 Associations, having 1328 employed officers with National Board headquarters at 600 Lexington Avenue, New York City. This national organization was formed (1906) by the union of two former national organizations. These two national bodies were the American Committee organized in 1886 as a national Young Women's Christian Association, and the International Board of Women's and Young Women's Christian Associations, organized in 1891. In its turn the national organization of the Young Women's

Christian Associations of the United States of America is a part of the World's Young Women's Christian Association organized in 1894 with headquarters at 26 George Street, Hanover Square, London, England.

A national convention composed of delegates from all affiliated Associations meets biennially to discuss policies, to take legislative action, and to elect its National Board which carries on the work of the Association during the period intervening between conventions. This National Board of volunteer workers, composed of thirty resident members and a representative from each of the field committees, employs a staff of 128 secretaries and office workers. The chief executive is known as the General Secretary. The budget of the National Board for 1913 was $395,576. The work of the Board is divided among eight departments: Method, Finance, Conventions and Conferences, Secretarial, Publication, Office, Field Work, and Foreign. The Department of Method carries on its work through three committees: (1) the Student Committee which projects, standardizes, and supervises the 670 student Associations, with a membership of 54,691, located throughout the United States in universities, colleges, academies, high schools, normal schools, professional schools, upon both public and private foundations, which have for their local activities religious and social work; (2) the small town and county committee, which is developing and organizing work among rural committees; and (3) the City Committee which through investigation, study, and experiment constructs and adapts plans for the work among women living in cities and towns, including work among immigrants, both in ports of entry and in centers of distribution, as well as among industrial workers and business women. The total value of real estate held by local city Associations (1912) is estimated as $8,500,000, with an annual budget expenditure of $3,000,000. The 208 city and town Associations with a membership of 195,603 are 80 per cent self-supporting. Further information concerning the work of all departments can be obtained by consulting the *Year Book* of the Young Women's Christian Association, the *Association Monthly*, which is the official organ of the national organization, and other publications which may be had through the Publication Department, 600 Lexington Avenue, N.Y.C.

The Educational Department of the City Association. — The activities of the city Association are as varied as the needs of the girls and women of whom they are composed, the Association endeavoring to provide for each one "whatever she needs most next." This gives to the Association through its physical and educational work a large opportunity which it is rapidly taking advantage of and developing to its utmost efficiency. The underlying aim of the educational department is to meet the practical needs of girls and women in daily life, to discover latent capacity and transmute it into power. It uses such means as class instruction, enrolling therein 42,241 students; educational clubs and study groups with an enrollment of 4337; Association libraries with 130,782 volumes; reading rooms supplied with the best periodic literature; and popular talks on subjects affecting the interests of women. Among the typical objects for class and club work are the following: (1) to fit unprepared girls to meet stated requirements for schools or special training, such as coaching for entrance to high school, college, or hospital training; (2) to give help in making up deficiencies in elementary education, *e.g.* English branches and elementary arithmetic; (3) to prepare for business life, bookkeeping, stenography, business methods; (4) to prepare for trade occupations, *e.g.* dressmaking, millinery, costume design, art design; (5) to increase the earning power and efficiency of employed women, *e.g.* English for stenographers, speaking voice for telephone operators, housekeeping for maids; (6) to prepare wage-earning women to become home makers and increase the efficiency of home makers, *e.g.* supper class cooking courses, house decoration, home millinery; (7) to stimulate the intellectual life of women in business or at leisure, *e.g.* current events, civics, social problems; (8) to form standards of taste and give opportunity for æsthetic self-expression, *e.g.* choral music, stenciling, arts and crafts; (9) to help girls to make wise choice of vocation, etc., *e.g.* occupations for women, local and national; (10) to meet the specific needs of individuals or groups, *e.g.* parliamentary law, social form, running an automobile. For these classes where busy women come often at considerable sacrifice of time and also of money, the best available teachers are employed. In large Associations all of the educational work is organized as a department with a trained educational specialist in charge of the work.

In many ways the educational work of the Young Women's Christian Association is unique in its function, as it has an opportunity to supplement the work of the public education. Only a small per cent of children from the lower grades of our public schools ever reach the grammar and high school grades, while the economic struggle is constantly drawing ill equipped children of from fourteen to sixteen into the fierce competition of industrial and mercantile employment. The demands are such that the unskilled and poorly trained can find no permanent place in the twentieth century organization. In our larger cities from 50 to 79 per cent of the women between the ages of sixteen and twenty are employed outside of the home. These figures do not include the girls from fourteen to sixteen who are in many instances engaged in unskilled labor. The public evening school does much to supplement the day school, but there are still large numbers of partially educated girls and women in every large community who cannot or do not choose to adapt themselves to the evening school hours and program. In some instances prescribed courses are not sufficiently elastic to fit the individual needs of those of adult years who have need of educational help along the lines of occupational employment or of inspiration for mental development and preparation for special service. It is into this largely unoccupied field for supplementary education that the Young Women's Christian Association's educational department has entered.

The work of the physical department is also one of great importance and is doing much for the health and happiness of the rising generation. Through its swimming pools, gymnasium classes, athletic games, lectures on personal hygiene, summer camps, and playground activities, it is doing much towards the upbuilding of wholesome and normal womanhood. Taking the physical and educational departments together, a large work is already being accomplished in the realm of supplementary education. In offering educational opportunities under Christian influences according to local conditions; in relating the work provided to the physical, economic, and social environment of the young women reached; in aiding them in their preparation for wage earning on a self-respecting basis, the Young Women's Christian Association is endeavoring to further the social teachings of Christ through actual service. Moreover, the educational department aims to open a channel of connection between all educational agencies of the city, such as schools, libraries, art galleries, lecture courses, and other local resources, and to put the intellectual wealth of the community at the service of all young women.

In its educational outreach the National Board includes the whole Association field. It serves the field by the maintenance of an efficient bureau of information on all current activities of local Associations by the preparation of recommended courses and setting of standards, by the testing of methods and making significant results available to all, and by direct assistance in putting well-defined ideals and plans into operation.

The National Training School. — The National Board through its Secretarial Department has devised and established a training system for Association-employed officers. This system is divided into three stages, (1) work in preparatory training centers — usually located at the field headquarters — where properly qualified college graduates are accepted for a three months' course of lectures and practical work. Examinations are conducted from the national headquarters, the successful candidates becoming eligible to enter the second stage of training; namely, (2) minor position in a local Association where practical experience is gained. After a year or more of experience candidates may be accepted at (3) the National Training School. The first and second stages in the training are not preliminary nor probationary but preparatory in the truest sense of the word.

The course of study at the National Training School is a highly specialized professional course, covering from one to two years of work and includes advanced Bible study, history, polity, and administration of the Young Women's Christian Associations, subjects relative to personal efficiency, religious pedagogy, social science, and correlated current movements. Students holding college degrees may also elect courses in the graduate schools of Columbia University, or at the School of Philanthropy, New York City. The secretaryships in Christian Association work open up a new profession for women, calling for their highest type of executive efficiency and to be compared in importance and requirements only with the highest positions in the leading women's colleges. For further information consult the catalogue of the National Training School, which may be had upon application to the Secretarial Department of the National Board, 600 Lexington Avenue, N.Y.C. E. R. B. and H. L. T.

YOUTH. — See ADOLESCENCE; GROWTH.

ZENO (*c.* 340–*c.* 250 B.C.). — A native of Citium in Cyprus and the founder of Stoicism. He is said to have come to Athens by accident, being shipwrecked at the Piræus. There he happened at a bookstall to come upon the *Memorabilia* of Xenophon, which aroused in him an enthusiasm for philosophy. He was directed by the bookseller to Crates the Cynic, whose disciple he became. While accepting the fundamental doctrines of the Cynics he was repelled by their crude interpretation of their motto "conformity with nature," and after studying under the Megarians and Platonists, he opened a school at the famous *Stoa Poikile.* (See STOICS.) He was highly honored by the Athenians and is said to have been given a public funeral at his death.

C. F. L.

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See also References under STOICS.

ZENODORUS. — See GEOMETRY.

ZILLER, TUISKON (1817–1882). — One of the most important representatives of Herbartian pedagogy, was born at Wasungen, near Meiningen, where his father was pastor. After graduating from the Meiningen gymnasium, he attended the University of Leipzig, studying philology under Gottfried Hermann (*q.v.*) and philosophy under the Herbartians Drobisch and Hartenstein. He commenced to lecture at Leipzig in 1853, opened his pedagogical seminary in 1862, and was appointed as "professor extraordinarius" in 1864. In 1869 he founded the "Association for Scientific Pedagogy" (*Verein für wissenschaftliche Pädagogik*), which formed a center for the adherents of Herbartian pedagogy in Germany. He died after a painful illness in 1882.

Ziller's contributions to pedagogy are very great, consisting in the further development of Herbart's ideas and their application to the public school. With Herbart he emphasizes the moral end of education and demands that, in order to form a strong character, the different parts of the course of study must be closely associated and unified; history and religion forming the core around which all other subjects are to be grouped. This is his theory of "concentration" (*q.v.*). The material of instruction, furthermore, should be arranged in a progressive series, adapted to the psychological development of the individual, which, in turn, corresponds to the steps by which the race has ascended from primitive life to a state of civilization. (See CULTURE EPOCH THEORY.) This idea, while by no means original with Ziller, was by him for the first time applied to the making of a course of study for the elementary school. In the practice school which was connected with his pedagogical seminary, the curriculum for each of the eight school years was based on a thought-whole, which was supposed to represent that stage of development in the history of mankind which was parallel to the stage which the pupil had reached in his own development. This material was arranged in two related series, one taken from biblical and the other from German history. Although his scheme of concentration was too artificial and too much determined by the peculiar conditions of the German school, Ziller nevertheless deserves great credit for having made the first attempt at solving as a whole the problem of the elementary course of study, and for showing in detail how every part of the instruction may be made to contribute to the training of character, the real end of education.

The most important of Ziller's works are *Einleitung in die allgemeine Pädogogik* (*Introduction to General Pedagogy*, 1856), *Grundlegung zur Lehre vom erziehenden Unterricht* (*Foundations of the Doctrine of Educative Instruction*, 1865), and *Allgemeine Pädagogik* (*General Pedagogy*, 1886). F. M.

See CULTURE EPOCH; HERBART.

ZOÖLOGY. — That division of biological science that deals with the phenomena of animal life. It presents these phenomena in so many aspects that it appeals to a wide range of interests. It has practical bearings for the medical man, the agriculturist, the breeder, the economic zoölogist, and it possesses deep mental interest for the philosopher and thinker. To fix its place, we must remember that one of the most striking developments of human learning of the past half century has been the great extension of the knowledge of organic nature and the new interpretations that have resulted. Zoölogy is the central subject of this advance, and it has come about that this science embodies our interpretation of nature as related to animal life and to man. Thus zoölogy has become a subject of great human interest, and it is chiefly owing to this circumstance that it occupies a prominent place in the program of studies of colleges and universities, and is of increasing importance in general education. There is, nevertheless, great vagueness among intelligent people regarding the nature of zoölogical study. Knowledge is little disseminated regarding its scope, its aims and purposes, its achievements, the epochs of its development, and the kind of work that is being carried on at the present time. Even the names of its notable men are little known. In popular estimation zoölogy is a subject that deals primarily with the naming and systematic arrangement of animals. This conception completely misrepresents the spirit of zoölogy as well as the contributions to knowledge of its chief representatives. The leading lines of observation are the structure, development, and physiology of animals, their past history, their habits, distribution, and relation to their surroundings, their mental powers and behavior, experiments on heredity, evolution, etc.

It will be the aim of this article to give in outline the more general aspects of zoölogy, while for an analysis of the animal kingdom with illustrations of types, it will be necessary to consult textbooks and manuals. The better textbooks and general writings on zoology are indicated in the bibliographical list at the end of the article.

Study of Animal Types. — The most striking general feature of an animal is that it has not arisen independently but exhibits a genetic connection with other members of the animal kingdom. Its ancestry is closely intermingled with that of other animals, and, as a result, the structure and development of animals present close similarities. Thus, the study of a few forms of the different natural groups, with an analysis of their life history and their general relations, may serve to open up the whole field of zoölogy. This Huxley did with the use of a single animal in his famous *Introduction to Zoölogy*, based upon the study of the crayfish in all its essential relations to the other animals and to nature at large. How to avoid having the study of a few types lead merely to the accumulation of unrelated fragments of knowledge, is a matter of capital importance, since this has been the result of this method in so many schools and colleges. The link that is lacking is attention to what we may call the background of zoölogy, — information about the conditions under which the subject developed, — the nature of the work of the men who made its advance possible, and an orderly, though brief, account of the steps in its development.

Historical. — As in human affairs present conditions can be understood only by reference to precedent conditions, so in zoölogy, a brief sketch of its rise is essential to an intelligent comprehension of the subject. It is not necessary to attempt to picture the crude beginnings of the observation of animated nature, and the dawning of ideas relative to animals and plants. Fact and fable were accumulated, and molded into the natural history of the ancients, which reached its highest development in Aristotle. He wrote and lectured on the history of animals (*Historia Animalium*) as an independent subject, and in his scheme he subordinated the ideas of classification to his observations on structure (*De Partibus*) and development (*De Generatione*). He made extensive studies of life histories and recorded many facts that were rediscovered only in the nineteenth century.

The notable development of science among the Greeks depended largely upon their method of inquiry, the direct observation of nature, and the application of reason to the data thus gathered. But after the overthrow of ancient civilization, the conditions of mental life were so altered that there came about an arrest of inquiry that bred ignorance and led to the decline of science. All independent observation ceased. Among the other things the world-shunning spirit of early Christians promoted a spirit that was hostile to free inquiry into natural phenomena, and the observation of nature came to be looked on as prompted by impious curiosity. The direction of intellectual life was assumed by the theologians, who were chiefly interested in the contemplation of the spiritual and of the supernatural. Without the enlightenment of observation and experiment, mystical explanations were invented for the natural phenomena, and ignorance and superstition were engendered. To question these mystical doctrines was to invite theological persecution, so that zoölogy with the other sciences languished.

A barren period of intellectual life followed. Nearly nineteen centuries after Aristotle, the dawning of the Renaissance brought once more the indispensable conditions for the progress of scientific learning. As the decline in science had been largely due to the substitution of authority for investigation as the method for ascertaining truth, so the revival, so far as zoölogy was concerned, was a return to the observation of nature. This new movement was a revolt of the intellect against existing conditions. In it was involved not only the progress of zoölogy but all the benefits that have accrued from the development of modern science. Vesalius, by placing morphological study on a new plane, stands closest related to zoölogy. His great illustrated work on the structure of the human body (1543), based entirely on observation, not only restored anatomy but also laid the foundation for the structural studies of animals.

After the rise of the Renaissance, Aristotle was translated, and small independent advances were made by various writers as Wotton (1552), Jonston (1549–1553), and Aldrovandi (1599-1606). The most important zoölogical work between Aristotle and John Ray, the immediate predecessor of Linnæus, was that of the Swiss, Conrad Gesner (1516–1565). His *Historia Animalium* is a voluminous publication, four volumes appearing between 1551 and 1556, and a fifth in 1587, twenty-two years after his death. In some editions it contains 4500 folio pages and nearly 1000 illustrations. The descriptions are in several parts of his work alphabetically arranged, for convenience of reference, and thus closely related animals are often widely separated.

Passing over the seventeenth century, in which Malpighi (1628–1694), Swammerdamm (1637–1680), and Leeuwenhoek (1632–1723) made great advances in independent observation, investigated insects and other simple animals, and produced valuable works on the minute structure and on embryology, we come to Linnæus (1707–1778) with whom systematic zoölogy may be said to have begun. The service of Linnæus to natural history was unique. He introduced clarity and system. The large number of animals and plants, ever increasing through the collections of travelers and naturalists, were in a confused state. They were known by local names in different sections of the same country and were differently designated in various languages. By adopting Latin as a uniform medium he elaborated a system of naming every production of nature in two words, a generic and a specific name, as *Felis domesticata* and *Canis familiaris*. This was adopted throughout the world and, thus, by a happy stroke he gave to natural science a common language. The influence of this may be realized when we remember that to-day naturalists of all countries use identical names for the same animals and plants. He also simplified the problem of identification by giving terse descriptions, involving only the salient points by which animals and plants may be recognized. His publication, the *Systema Naturae*, which passed through twelve editions (first edition 1735), is by no means a treatise on organization of animals and plants, but a methodically arranged catalogue with brief descriptions and their new names. The *Systema* embraces also a consideration of minerals. Thus Linnæus is the founder of the nomenclature of natural history, and by common consent, zoölogists accept as the starting point for zoölogical names the tenth edition of the *Systema* published in 1758. The botanists frequently use as a base line for names his *Species Plantarum* of 1753. While Linnæus made a lasting impression, he gave to natural history a one-sided development. His followers were chiefly collectors and classifiers, who by interminable species-making brought zoölogy into disrepute, from which it was rescued by Cuvier and others. Linnæus also defined species, which centered attention on the distinguishing characters of animals, and paved the way for the consideration of the origin of the species that became so significant, under Darwin, in the nineteenth century. He was preceded by John Ray (1628–1705), who was the first to introduce into natural history an exact conception of species.

The influence of Cuvier (1767–1832) was dominant in zoölogy in the early years of the nineteenth century. This French zoölogist and legislator showed a zeal for the study of animal structure, and founded comparative anatomy and vertebrate paleontology. He divided the animal kingdom into branches (*embranchements*) on the basis of their structure, recognizing four great types of structure, the radiate, articulate, molluscan, and vertebrate. The distinguishing feature of Cuvier's mind was comprehensiveness. In his investigations he covered the whole field of animal organization from the lowest to the highest, and combining his results with what had been accomplished by earlier workers, he established comparative anatomy on broad lines as an independent branch of natural science. Cuvier represents the beginning of that side of zoölogy that reached its highest development in Karl Gegenbaur (1826–1903) and Max Fürbringer in Germany; in Owen (1804–1892) and Huxley (1825–1895) in Great Britain; and in Joseph Leidy (1823–1891) and E. D. Cope (1840–1897) in the United States.

After Cuvier came the establishment of embryology, in which Von Baer (1797–1876) was the central figure. In 1828, by the publication of his detailed observations and comments on the development of the chick and other animals (1834), he established the germ-layer idea and carried the science of development of animals to a high level. His book on the development of animals (*Entwickelungsgeschichte der Thiere,— Beobachtung und Reflexion*) is one of our greatest biological classics. Von Baer was a man of superb mental endowment, unusual in the way in which he combined accurate observation with sane and fruitful generalization. His "reflections" on the general features of the development of animals are still of value. Since animals in the course of their development exhibit stages of their ancestral history that supply clues to their true relationships, the study of embryology is of great importance in zoölogy.

Johannes Müller (1801–1858), a colossal intellectual figure, whose work influenced all scientific progress, was the best interpreter of the study of animal activities. He was at once morphologist and physiologist, an inspiring teacher, who profoundly stimulated the mental development of some of the greatest men of science of Germany, as Helmholtz, Ludwig, etc. Although classed as a physiologist, his influence on the development of zoölogy was so great that he must be also recognized in this connection.

The rise of the cell theory had profound influence upon zoölogy. Up to this time the significance of tissues was unappreciated. The tissues, as component parts of organs, had been studied by the brilliant Bichat (1771–1802), but the cell theory supplied the illumination that lighted the obscurity surrounding them, and showed cells and tissues in organic relation. The conception that the tissues of animals and plants are composed of similar units was given to the world in 1838–1839 through the combined labors of Schleiden, the botanist, and Schwann, the anatomist. The work of Schwann was much more extensive and important than that of his contemporary. By this master-stroke of generalization all living organisms were united on a broad plane of similarity in structure. The unifying power of the cell theory was great and the whole science of zoölogy profited. In embryology, the eggs and sperms were soon recognized to be merely modified cells, and then the origin of cells in the body became clear. As the science of development showed, every organism above unicellular forms begins its existence in the condition of a single cell and advances step by step to its adult condition. By the segmentation of the fertilized egg numerous cells arise that become arranged into layers from which the tissues are differentiated, and, by combinations of these tissues, the organs of the body are produced.

A still deeper analysis was required to expose the actually living substance of organisms, or protoplasm, within which all physiological activities take place. Although observed and experimented with in animals by Dujardin in 1835, in plants by Von Mohl in 1846, it was not till Max Schultze, in 1861, showed the essential identity of animal (sarcode) and plant protoplasm that the protoplasm doctrine was established. This led to the foundation of biology in its modern sense, and thereafter the study of zoölogy involved the study of the activities and the productions of protoplasm. It thus appears that from Linnæus to Darwin, although the details of the subject were greatly multiplied, the progress of zoölogy was by a series of steps involving a logically progressive analysis. First the organism was studied as a whole (Linnæus), next the organs were brought under consideration (Cuvier), then their component parts, the tissues (Bichat), the units of organic structure, the cells (Schwann), and, finally, protoplasm, the physical basis of life (Schultze).

The discovery of the lineage of animals, and the establishment of the doctrine of organic evolution (Darwin, 1859), has done more to enrich the subject of zoölogy than any other advance. It is the recognition that the higher animals have been derived by modification from the simpler ones that clears up many of their heretofore perplexing relations. In its great sweep the doctrine of evolution is one of the greatest acquisitions of human knowledge, influencing not only zoölogy, but all thought regarding the universe and our relation to it. Since this is a doctrine more fully illustrated in zoölogy than any other science, it adds an especial importance to the study of zoölogy as a subject of general education. Lamarck (1744–1829) was the first to announce, in 1801, a comprehensive theory of evolution that has lasted to the present, while Darwin's especial contribution (1859) was the designation of natural selection as the chief agency in bringing about the evolution of plants and animals. Besides these two, the theories of Weismann and De Vries have attracted the most attention.

Subdivisions and Recent Tendencies. — After this outline sketch of the rise of zoölogy there remains to indicate the divisions of the subject, and some recent tendencies. Broadly speaking, its main currents are represented by structural zoölogy (morphology, histology, embryology); systematic zoölogy (classification, for which the modern name is *taxonomy*); general physiology, geographical distribution, and ecology (the relations between animals and their surroundings); and the study of fossil animals (paleontology). A department called *etiology* is sometimes recognized, having as its object the investigation of zoölogical phenomena, but it need not be assigned an independent rank, since the study of all phenomena has the discovery of their causes as an ultimate object.

The number of known animals is ever increasing by the description of new species. Aristotle mentioned about 500, but probably knew more. Linnæus, in 1758, described 4236 species. About a hundred years later, Agassiz and Bronn listed 129,530. In 1886 Ludwig's revision of Linnæus gives 273,220, and Pratt, in 1911, enumerates 522,400. This represents the named species only, and of the number 360,000 are insects.

Zoölogy has been broadened and enriched by the cultivation of especial lines of interest, and this has led to an arbitrary subdivision of some of its larger provinces. The study of eugenics (*q.v.*) commands at present a large place. This scientific study of the conditions that may improve or impair the racial qualities of future generations was especially fostered by Sir Francis Galton (1882–1911). The investigation of extinct animals is properly included in zoölogy since they are merely the forerunners of living animals, though the study is usually pursued as a separate science designated paleontology. From the zoölogical standpoint, especial interest has centered about the fossil remains of man and of prehumans that are throwing much light on the question of human lineage. A new impulse has been given to this subject by the discovery of the ape-like man of Java (1891–1894), the jaw of Heidelberg (1908), and the recent scientific analysis of the remains of paleolithic man in the caves of southwestern France.

In reference to unicellular organisms, a department of *protozoölogy* has been created with especial reference to pathogenic protozoa. The study of the life history of the pathogenic protozoa and of parasitic worms, and other disease-producing animal organisms has developed into a department of parasitology. The application of zoölogical facts to the benefit of mankind is a considerable feature of present-day work. Under this general heading are included the demonstration of the connection between insects and the propagation of yellow fever, malaria, sleeping sickness, and other disorders. Although still in their infancy much benefit has already accrued from zoölogical studies of this character.

General physiology, as concerned with the vital processes of all organisms, is clearly a department of zoölogy. The many experiments engaged in by the zoölogists to determine the responses and adaptations of animals under different forms of stimulation, and their development under varying mechanical conditions and changed chemical environments, has opened the interesting field of experimental morphology. A department of experimental zoölogy has been founded on broad lines. Among others, experimental studies on inheritance and investigation of the alternative inheritance of Mendel (1822–1884) have been actively carried on.

Animal psychology and *animal behavior* have become much cultivated fields, throwing light on some of the basal problems of the development of animal intelligence and of estimating the mental equipment of different animals. As there are gradations in morphology showing the specialized structures arising by the modification of the simpler ones, so in animal intelligence there is a graded series of states keeping pace with the structural differentiation of the nervous system.

In the line of *cellular studies* there has been great refinement of technique and of observation. The minute constitution of the germinal elements and of the cellular phenomena of development has been worked out, and the physical basis of inheritance has been located in the chromosomes and also, more recently, in the cytoplasm of the egg.

Marine zoölogy has been greatly developed by exploring expeditions and the establishment of seaside stations. The most famous of these is the international research station at Naples (*Stazione Zoölogica*), founded by Anton Dohrn in 1872. In the United States, Louis Agassiz was the pioneer with his marine station started in 1873 on the island of Penikese, Mass. The station at Woods Hole, Mass., is, in a sense, the successor of the Penikese laboratory. It was chiefly developed by Whitman (1842–1910), a disciple of Agassiz. Other stations of the United States on the Atlantic coast, as Cold Spring Harbor, New York; Harpswell, Maine; Dry Tortugas, Florida; and Beaufort, North Carolina, are supplemented by those of the Pacific coast, as Friday Harbor, Washington; Ocean Grove, California; La Jolla, California; and other places. In Great Britain the leading station is at Plymouth, while the marine stations of other European countries are numerous and important.

The exploration of the abysmal depths and the survey of the sea bottom have been carried on by various government expeditions. The notable voyage of the *Challenger* (1872–1876) has led to the publication of monumental reports written by the coöperation of zoölogists of different parts of the world. The recent Siboga expedition of Holland brought much additional information. To this class of voyages belong those on which Darwin (*The Beagle*) and Huxley (*The Rattlesnake*) made their trips as naturalists. In the deep sea investigation Sir John Murray and Alexander Agassiz have done notable work. Fresh water stations have been established at Plön, Holstein, and at many places in the United States and other countries, in which the fauna of lakes and rivers have been scientifically studied. In connection with aquatic observations, there has developed the *plankton work*, consisting of studies, both qualitative and quantitative, on the minute floating life of waters.

Various adjuncts, as museums and zoölogical gardens, have been helpful to the work of zoölogists. They have been not only of service in the dissemination of knowledge of animals among the masses, but they have also gathered valuable collections that have been employed in the researches of specialists.

The entomological bureau of the United States and the state entomologists have done much to advance the knowledge of insects, and the lavish publications of the government have placed in hand many valuable reports on animal life and animal industry. The activities of the Fish Commission are also notable.

Zoölogy in the Curriculum. — Morphology and development are the aspects of zoölogy that have been emphasized in introductory courses in colleges and universities of the United States, and at present ecology is coming into favor. In the stronger universities, with not less than three men (besides laboratory assistants) on the zoölogical staff, the courses of instruction open to undergraduates embrace special consideration of various divisions of the subject. There is considerable diversity in these courses in the different universities, depending on the special interests of members of the instructing staff. Thus protozoölogy, parasitology, eugenics, fossil remains, historical aspects, the behavior of organisms, etc., may form the background for especial courses. There is general agreement that facilities for the rearing and control of living organisms and for experimental studies are essential. The graduate work in zoölogy in the United States has been diversified and of excellent quality. For the past fifteen years the general level of the doctorate thesis in zoölogy of American universities has not been surpassed by that of any of the other world universities.

In British schools, as in the United States, zoölogy in the smaller schools is taught as a part of nature study. In a few larger schools, as Eton, Charterhouse, etc., there are excellent zoölogical courses. In a number of secondary schools zoölogy is taught in connection with botany under the general title of biology. The British zoölogists have derived inspiration and high standards from great teachers and investigators, as Foster, Balfour, Darwin, Huxley, Marshall, Lankester, Morgan, etc. The high standards established by these men for university work have been maintained by their successors in England; John Beard in Edinburgh and J. Arthur Thomson in Aberdeen have conducted zoölogical courses on the same high level.

Zoölogy has long been a subject of study in the schools of Germany and has been made more interesting to younger pupils by excursions, field observations, and the forming of collections. In the German universities it first reached a development commensurate with its importance as a department of human learning, so that the past generation of zoölogists deemed it necessary to go to Germany for graduate work. Men of the highest attainments and personal influence, as Gegenbaur (Heidelberg), Leuckart (Leipzig), Wiedersheim (Freiburg), Von Kölliker (Würzburg), Von Kupffer (Munich), and others, exercised a strong drawing force on those who aspired to the doctorate in zoölogy.

Foreign students were also attracted to France, although in lesser number, by such men as Lacaze-Duthiers, Milne-Edwards, Henneguy, and Giard.

Teaching of Zoölogy. — The teaching of elementary zoölogy is difficult and has not yielded the best results for the lack of properly qualified teachers. As a new science making its way in the already overcrowded program of studies, it has often fallen, as an assigned task, into the hands of one without sufficient grasp of the subject. It is a common mistake for the high school teacher to reduce to smaller compass his college course in zoölogy, but otherwise to make no changes in topics and methods of presentation. Instead of this, the work should be adapted to local conditions and to the age of the pupil. By the intending teacher, college work should be looked upon merely as generic preparation, while the specific instruction to high school students must be the result of independent thinking, a knowledge of the local fauna, and careful arrangement. When the zoölogical work comes in the first year of the high school, field work and carefully supervised laboratory observation may best be in the line of natural history and ecology, but, when placed in the fourth year, after some study of physics and chemistry, it can be taught more nearly like the college course, with some attention to the ideas of the science. In all the elementary work the zoölogy teacher should have sufficient independence to be a law unto himself, and to adapt his instruction to the needs of the particular pupils that come under his care. The great principle to follow is that whatever is undertaken shall be thoroughly done, so as to give the student a respect for careful work, and that it shall lead to the formation of good mental habits and shall stimulate mind growth. For zoölogy in the first high school year there is no single book more suggestive as to the method and spirit than Morse's *First Book of Zoölogy*, unfortunately now out of print. In the opinion of the writer the groundwork of zoölogical instruction for the fourth year is well presented in Bigelow's *Applied Biology* (New York, 1912).

The task of the college teacher of zoölogy is in a measure easier than that of the high school teacher. With more mature students it is possible to aim more at giving a unitary picture of zoölogical science. The significance of the facts can be brought out in connection with training in exact observation in the laboratory, and ecological studies made to take on a broader aspect. In the lecture room, as an adjunct to the laboratory, there is a movement in the direction of profiting by the methods so long in vogue in teaching philosophy, in which the historical development of the ideas is sketched as a basis for understanding those now dominant. When the ideas are thus brought under consideration zoölogy is a subject of great enlightenment and an excellent subject for general education.

W. A. L.

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ZÜRICH, UNIVERSITY OF, SWITZERLAND. — The University of Zürich was founded by the Cantonal Council of Zürich in the cantonal capital in 1833. There had already existed before this date provision for the study of theology and a gymnasium or Carolinum, a school which dated from the Middle Ages, and was reorganized in 1802; for the study of medicine at the Medical Surgical Institute, founded in 1782; and for law, administration, and political science at the Political Institute, opened in 1807 and finally organized in 1813. The University was opened at Easter, 1833, with forty-six instructors and 161 students in the four faculties of medicine, theology, political science, and philosophy. Departmental libraries and scientific collections were obtained by loan from the city and from professional and scientific societies. The early development of the University was beset by many difficulties. In 1834 Bern established a rival institution and drew away a few of the professors from Zürich. Owing to the political disturbances in Germany, many students fled to Zürich to avoid arrest for their democratic teachings. And, finally, the citizens so strongly opposed the appointment of David Friedrich Strauss, author of the *Life of Jesus*, to the chair of theology in 1839, that there was some talk of closing the University. After the early difficulties had been surmounted, the University made normal progress. The faculties were rearranged, the number of chairs was increased, and more suitable buildings were obtained after 1859. The organization of the University is very similar to that found in the German universities, with some exceptions. The rector and deans are elected for two years; the professors are appointed not for life but for periods of six years. A pension fund exists, and has been increased by the Abegg-Arter Endowment given in 1908. There are at present the following faculties: theology

(Protestant); law and political science; medicine; veterinary medicine (since 1902); philosophy, since 1859, divided into (*a*) philosophical, philological, historical, and (*b*) mathematical-scientific sections. Under political science there is included a section for commercial education. The enrollment in 1911 was 1407.

See SWITZERLAND, EDUCATION IN.

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ZWINGLI, HULDREICH (1484–1531). — The Swiss Protestant reformer. He was born at Wildhaus, St. Gall, the son of a peasant. He attended the high school at Bern, and studied at Vienna and Basel. In 1506 Zwingli was ordained a priest, but became a reform leader through his denunciation of superstitious pilgrimages. His life's work is practically identical with the Swiss reformation movement. In theology he broke more thoroughly than Luther with the medieval church. His views are stated at length in the *First Helvetic Confession* and constitute the "Reformed" as distinguished from the Lutheran doctrine. Aside from the general educational influence of all Reformation leaders, Zwingli's chief connection with education is in his pamphlet on *Eine Kurze Unterweisung wie man die Jugend in guten Sitten und christlicher Zucht erziehen und lehren solle* (The manner of instruction and bringing up boys in a Christian way) (1524).

See REFORMATION AND EDUCATION; SWITZERLAND, EDUCATION IN.

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